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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivided according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT

ON

BOONE AND SOUTH HOLSTON RESERVOIRS
WASHINGTON, SULLIVAN, AND CARTER COUNTIES
TENNESSEE
WASHINGTON COUNTY, VIRGINIA

EPA REGION IV

WORKING PAPER NO. 443

WITH THE COOPERATION OF THE

TENNESSEE DEPARTMENT OF PUBLIC HEALTH

AND THE

TENNESSEE NATIONAL GUARD

SEPTEMBER 1976

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by the U.S. Environmental Protection Agency and to augment plans implementation by the states.

ACKNOWLEDGMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Tennessee Department of Public Health for professional involvement, to the Tennessee National Guard for conducting the tributary sampling phase of the Survey, and to those Tennessee wastewater treatment plant operators who provided effluent samples and flow data.

The staff of the Division of Water Quality Control, Tennessee Department of Public Health; the Division of Environmental Planning, Tennessee Valley Authority; and the Nashville District Corps of Engineers provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper series.

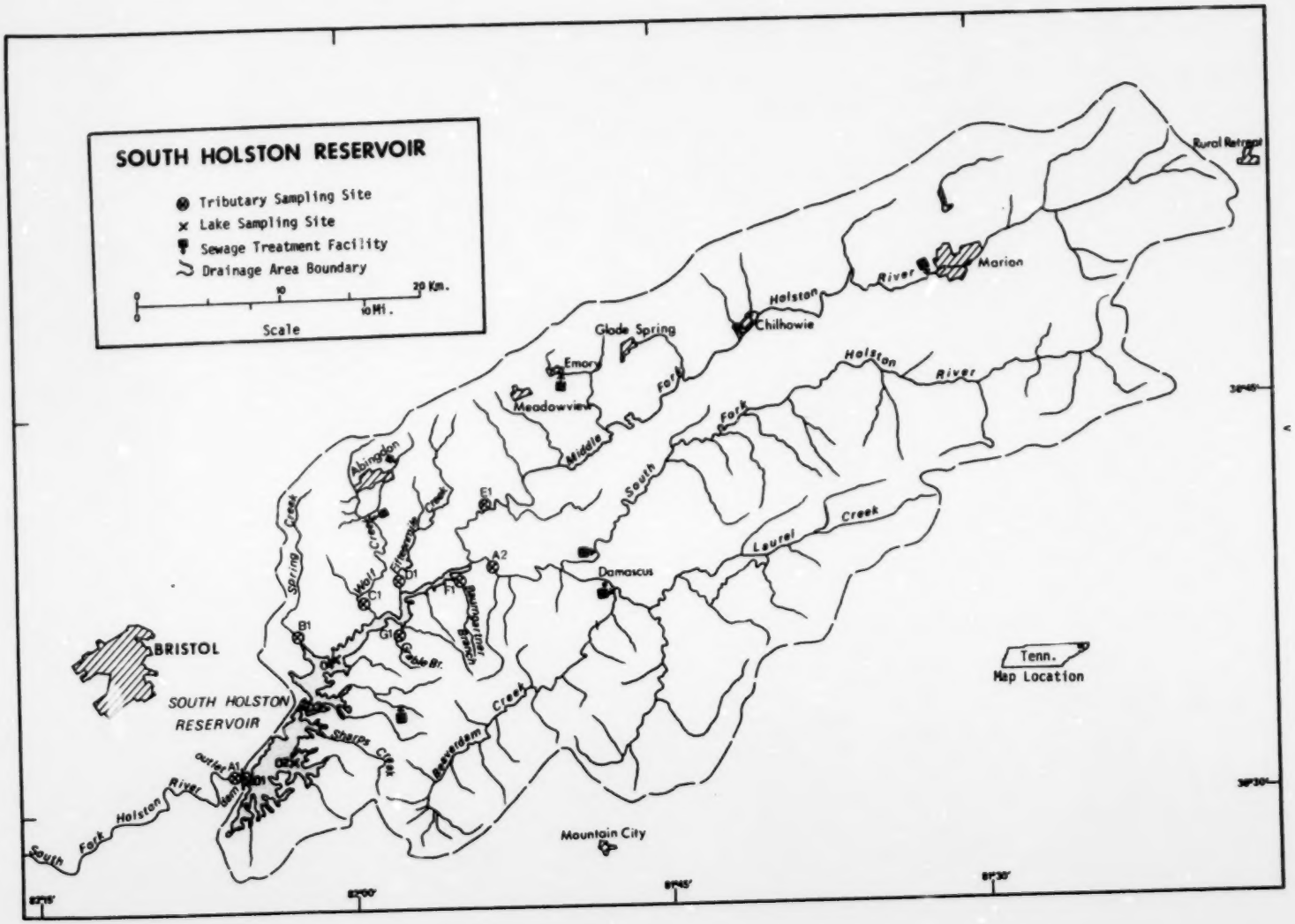
Major General William C. Smith, former Adjutant General of Tennessee, and Project Officer Colonel Wilburn C. Johnson, who directed the volunteer efforts of the Tennessee National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

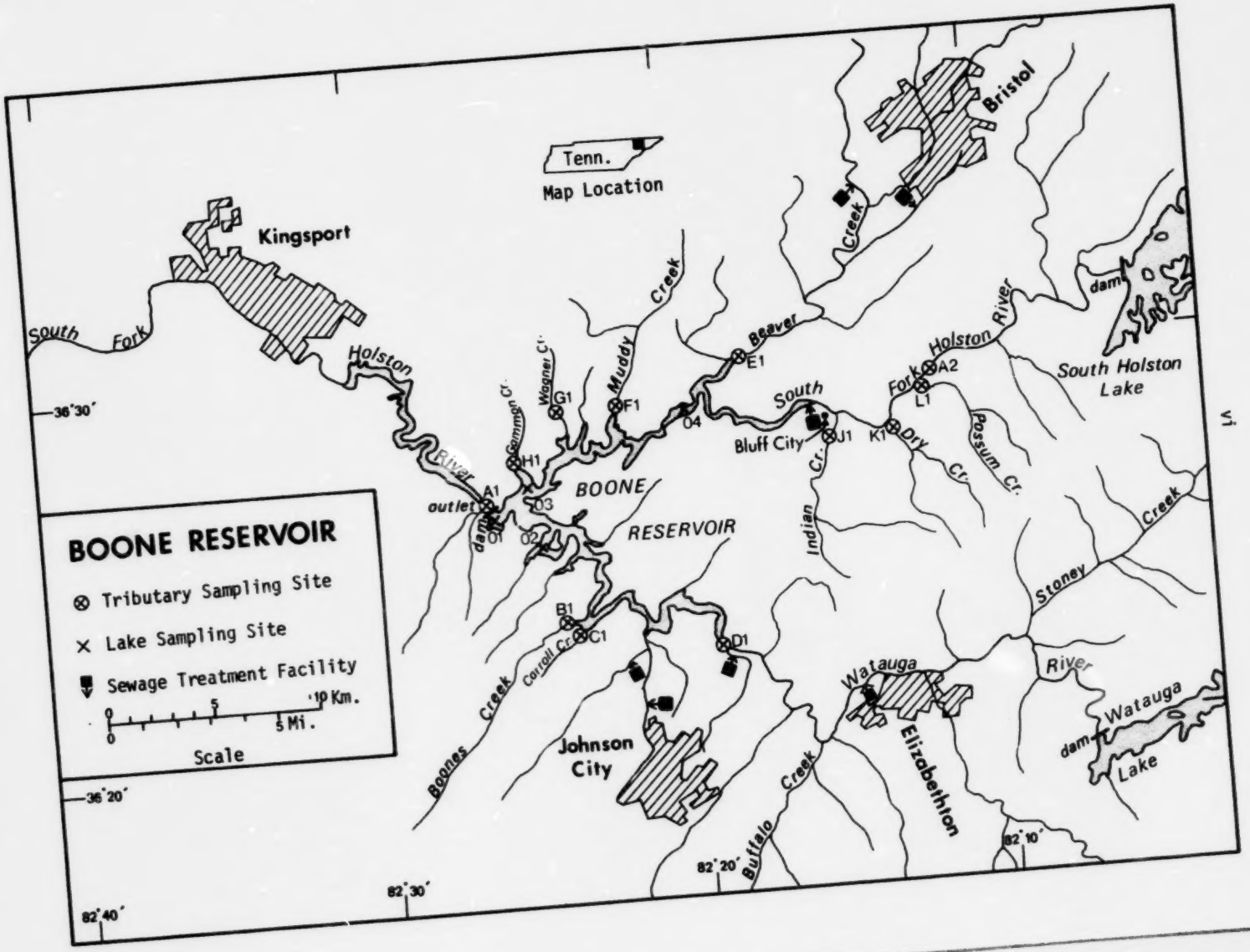
NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF TENNESSEE

LAKE NAME	COUNTY
Barkley	Stewart, Montgomery (Trigg, Lyon in KY)
Boone	Washington, Sullivan, Carter
Cheatham	Cheatham, Davidson
Cherokee	Jefferson, Hamblen, Grainger, Hawkins
Chickamauga	Hamilton, Rhea, Meigs, McMinn
Douglas	Sevier, Jefferson, Cocke
Fort Loudon	Loudon, Knox, Blount
Great Falls	White, Van Buren
Nickajack	Marion, Hamilton
Old Hickory	Sumner, Davidson, Wilson, Smith, Trousdale
Percy Priest	Davidson, Rutherford
Reelfoot	Obion
South Holston	Sullivan (Washington in VA)
Tims Ford	Moore, Franklin
Watts Bar	Rhea, Meigs, Cumberland, Roane, Loudon
Woods (Elk River)	Franklin, Coffee


SOUTH HOLSTON RESERVOIR
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Drainage Area Boundary
0 10 20 Km.
0 10 Mi.
Scale
Rural Retreat
Marion
Holston River
Chilhowie
Glade Spring
Emory
Meadowview
Middle Fork
South Fork
Holston River
Abingdon
Spring Creek
Wolf Creek
Hillsville Creek
Damascus
Laurel Creek
BRISTOL
SOUTH HOLSTON RESERVOIR
Glade Br.
Beaverdam Creek
Shelps Creek
Tenn.
Map Location
Mountain City
South Fork Holston River
A1
A2
B1
C1
D1
E1
F1
G1
36°45'
36°30'
82°15'
82°00'
81°45'
81°30'


Tenn.
Map Location
Kingsport
Bristol
South Fork Holston River
Holston River
Beaver Creek
Muddy Creek
Wagner Cr.
Gammon Cr.
South Holston Lake
dam
Bluff City
South Fork Holston River
Indian Cr.
Ory Cr.
Possum Cr.
Stoney Creek
BOONE RESERVOIR
outlet
dam
Boones Creek
Cornell Cr.
Johnson City
Watauga River
Watauga Lake
Elizabethton
Buffalo Creek
36°30'
36°20'
82°40'
82°30'
82°20'
82°10'
A1
A2
B1
C1
D1
E1
F1
G1
H1
J1
K1
L1
01
02
03
04
BOONE RESERVOIR
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
0 5 10 Km.
0 5 Mi.
Scale

REPORT ON SOUTH HOLSTON AND BOONE RESERVOIRS, TENNESSEE

STORET NOS. 4725 and 4704

I. CONCLUSIONS

A. Trophic Condition:

Based upon field observations and Survey data, South Holston Reservoir is considered meso-eutrophic, and Boone Reservoir is considered eutrophic. South Holston Reservoir is characterized by a low potential for primary productivity as measured by algal assay control yield and generally good Secchi disc visibility. Chlorophyll a values ranged from 3.2 µg/l in the fall to 15.2 µg/l in the spring. All of the other Tennessee lakes sampled in 1973 had higher median total phosphorus concentrations than South Holston Reservoir, and only two had higher median inorganic nitrogen.

Boone Reservoir is characterized by a high potential for primary productivity, and poor Secchi disc visibility. Chlorophyll a values ranged from a low of 5.8 µg/l to a high of 35.2 µg/l. Six of the Tennessee lakes sampled had higher median total phosphorus concentrations than Boone Reservoir, but none had higher median inorganic nitrogen levels.

Limnologists observed no visible algal blooms or problem aquatic macrophytes on either reservoir during the sampling year. However, in the past, algal blooms responsible for several fish kills have been reported on Boone Reservoir (E. Roberts, 1976).

B. Rate-Limiting Nutrient:

Algal assay results indicate that South Holston and Boone Reservoirs were limited by available phosphorus levels. Spikes with either phosphorus or phosphorus and nitrogen simultaneously resulted in increased assay yields. Addition of nitrogen alone did not stimulate a growth response. The observed ratios of total available inorganic nitrogen to orthophosphorus (N/P) further substantiate these results.

C. Nutrient Controllability:

1. Point sources -

The mean annual phosphorus load from point sources was estimated to be 40.8% of the total load reaching South Holston Reservoir. The city of Marion was estimated to contribute 18.7% and the city of Abingdon, 10.3%; the town of Chilhowie contributed 5.6% of the total phosphorus load. The remaining phosphorus point source load was attributable to five smaller sewage treatment plants.

The mean annual phosphorus load from point sources was 49.8% of the total load reaching Boone Reservoir. Johnson City (two plants) was estimated to contribute 26.0% of the total load, the city of Bristol contributed 21.0%, and the towns of Elizabethton and Bluff City contributed 2.2% and 0.6%, respectively, of the total load.

The calculated South Holston phosphorus loading rate of 1.76 g $P/m^2/yr$, and the Boone loading of 10.73 g $P/m^2/yr$ are substantially higher than those proposed by Vollenweider (1975) as "eutrophic" for lakes with such volumes and hydraulic retention times. These loadings include other large discharges to Boone Reservoir of nutrient rich industrial wastes which substantially influence the lake, and numerous package plants (particularly schools) discharging to the

tributaries of both reservoirs (Tennessee Dept. of Public Health, manuscript). No information is available on the annual nutrient contributions of these sources; however, it is expected that reduction or elimination of point source loadings would result in water quality improvement in both lakes.

2. Nonpoint sources -

The mean annual phosphorus load not attributable to nearby or sampled point sources was about 59.2% and 50.2%, respectively, of the total reaching South Holston and Boone Reservoirs. In South Holston Reservoir, the Middle Fork Holston River accounted for 29.7% of the total, the South Fork Holston River accounted for 15.8%, and ungaged drainage areas were estimated to account for 3.1%. In Boone Reservoir, the Watauga River accounted for 27.9% of the loading, Beaver Creek accounted for 15.1%, and ungaged drainage areas were estimated to contribute 0.2%.

The high loading rates of the Watauga River and Beaver Creek (Boone Reservoir) include unmeasured nutrient discharges, particularly industrial, from the towns of Elizabethton and Bristol. Among these industrial waste sources are Beaunit Corporation and Bemberg Industrial, Inc. in Elizabethton. The Tennessee Valley Authority (L. Clark, 1976) indicates that the

estimated ammonia-nitrogen load during 1973 from Beaunit Corporation was 7,250 x 10^3 kg/yr. However, the two sources cited were not included in the National Eutrophication Survey (NES) sampling of Boone Reservoir so do not appear in the point source section of the nutrient budget, on pages 19-20.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

Lake and drainage basin characteristics are itemized below. Lake morphometry data and hydraulic retention times were provided by the Tennessee Valley Authority. Tributary flow data were provided by the Tennessee District Office of the U.S. Geological Survey (USGS) (outlet drainage areas include the lake surface area). Drainage areas for the Watauga River, Beaver Creek, and Possum Creek, tributaries D-1, E-1, and L-1 (Boone Reservoir) were provided by the Tennessee Valley Authority. Tributary drainage areas plus reservoir surface area in either reservoir do not equal the outlet drainage area probably because of differences in the pool elevation used by the different sources in their calculations. The sum of the tributary flows do not equal the outlet flows in either lake probably because of either sampling error, unmeasured groundwater influence, or unknown inputs reaching the lake. Precipitation values are estimated by methods as outlined in NES Working Paper No. 175. A table of metric/English conversions is included as Appendix A.

A. Lake Morphometry:

		South Holston Reservoir	Boone Reservoir	
1.	Surface area:	30.68	17.80	km^2.
2.	Mean depth:	26.4	13.3	meters.
3.	Maximum depth:	74.4	39.6	meters.
4.	Volume:	942.394	238.682	x 10^6 m^3.
5.	Mean hydraulic retention time:	338	41	days.

B. Tributary and Outlet (see Appendix B for flow data):

1. Tributaries - South Holston Reservoir

Name	Drainage area (km^2)	Mean flow (m^3/sec)
A(2) South Fork Holston River	826.2	13.80
B(1) Spring Creek	44.5	0.57
C(1) Wolf Creek	69.2	1.04
D(1) Fifteenmile Creek	42.2	0.63
E(1) Middle Fork Holston River	632.0	10.55
F(1) Baumgartner Branch	8.1	0.10
G(1) Grable Branch	3.2	0.04
Minor tributaries and immediate drainage -	165.8	1.86
Totals	1,791.2	28.59

2. Outlet -

A(1) South Fork Holston River	1,820.8	25.32

Boone Reservoir

Name	Drainage area (km^2)	Mean flow (m^3/sec)
A(2) South Fork Holston River	1,981.3	27.86
B(1) Boones Creek	35.5	0.40
C(1) Carroll Creek	7.6	0.08
D(1) Watauga River	2,250.0	32.50
E(1) Beaver Creek	282.3	3.12
F(1) Muddy Creek	40.4	0.45
G(1) Wagner Creek (Bowman Creek)	11.9	0.13
H(1) Gammon Creek	2.6	0.03
J(1) Indian Creek	47.7	0.75
K(1) Dry Creek	20.4	0.32
L(1) Possum Creek	21.7	0.34
Minor tributaries and immediate drainage -	43.2	0.55
Totals	4,744.6	66.53

Outlet -

A(1) South Fork Holston River	4,765.6	65.85

C. Precipitation:

1. Year of sampling: 121.3 centimeters.
2. Mean annual: 104.7 centimeters.

Year of sampling: 121.3 centimeters.
Mean annual: 104.7 centimeters.

III. LAKE WATER QUALITY SUMMARY

South Holston and Boone Reservoirs were sampled three times during the open-water season of 1973 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from four stations on the lakes and from a number of depths at each station (see maps pages v and vi). During each visit, depth-integrated samples were collected from each station for chlorophyll a analysis and phytoplankton identification and enumeration. During the first visit, 18.9-liter depth-integrated samples were composited for algal assays. Maximum depths sampled were 60.3 meters at Station 1, 48.8 meters at Station 2, 42.7 meters at Station 3, and 30.5 meters at Station 4 on South Holston Reservoir and 32.0 meters at Station 1, 30.5 meters at Station 2, 33.5 meters at Station 3, and 18.3 meters at Station 4 on Boone Reservoir. For a more detailed explanation of NES methods, see NES Working Paper No. 175.

The results obtained are presented in full in Appendix C and are summarized in III-A for waters at the surface and at the maximum depth at each site. Results of the phytoplankton counts and chlorophyll a determinations are included in III-B. Results of the limiting nutrient study are presented in III-C.

SOUTH HOLSTON LAKE
STORET CODE 4725

PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	N*	(5/23/73) S*** = 4 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	N*	(8/20/73) S*** = 4 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	N*	(10/27/73) S*** = 4 RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	8	18.1- 60.0	36.8	0.0- 1.2	8	26.8-144.0	43.5	0.0- 1.5	4	84.0-180.0	126.0	0.0- 0.0
MAX DEPTH**	4	6.7- 9.5	7.0	30.5- 60.3	4	6.8- 13.1	8.8	28.3- 57.9	4	5.8- 17.6	10.7	23.5- 48.8
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	4	9.6- 11.4	11.0	1.2- 1.2	4	7.0- 9.0	8.8	1.5- 1.5	0	******-******	*****	*****-*****
MAX DEPTH**	4	4.8- 7.6	6.1	30.5- 60.3	4	0.2- 5.4	1.6	28.3- 57.9	4	0.0- 5.4	2.5	23.5- 48.8
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	8	160.- 180.	170.	0.0- 1.2	8	154.- 162.	161.	0.0- 1.5	4	166.- 172.	168.	0.0- 0.0
MAX DEPTH**	4	180.- 200.	190.	30.5- 60.3	4	114.- 141.	127.	28.3- 57.9	4	119.- 179.	154.	23.5- 48.8
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	8	8.7- 9.0	8.8	0.0- 1.2	8	7.9- 8.8	8.2	0.0- 1.5	4	7.7- 8.2	7.9	0.0- 0.0
MAX DEPTH**	4	7.3- 7.8	7.5	30.5- 60.3	4	6.3- 8.0	7.8	28.3- 57.9	4	7.1- 7.9	7.2	23.5- 48.8
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	8	73.- 84.	79.	0.0- 1.2	8	66.- 75.	72.	0.0- 1.5	4	82.- 85.	83.	0.0- 0.0
MAX DEPTH**	4	83.- 86.	85.	30.5- 60.3	4	81.- 91.	85.	28.3- 57.9	4	80.- 105.	87.	23.5- 48.8
TOTAL P (MG/L)												
0.-1.5 M DEPTH	8	0.022-0.029	0.027	0.0- 1.2	8	0.010-0.021	0.015	0.0- 1.5	4	0.008-0.019	0.010	0.0- 0.0
MAX DEPTH**	4	0.013-0.059	0.017	30.5- 60.3	4	0.011-0.035	0.031	28.3- 57.9	4	0.008-0.100	0.044	23.5- 48.8
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	8	0.004-0.024	0.008	0.0- 1.2	8	0.003-0.011	0.005	0.0- 1.5	4	0.008-0.014	0.012	0.0- 0.0
MAX DEPTH**	4	0.005-0.017	0.009	30.5- 60.3	4	0.006-0.009	0.007	28.3- 57.9	4	0.009-0.021	0.016	23.5- 48.8
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	8	0.380-0.440	0.415	0.0- 1.2	8	0.040-0.080	0.060	0.0- 1.5	4	0.140-0.350	0.210	0.0- 0.0
MAX DEPTH**	4	0.790-0.860	0.795	30.5- 60.3	4	0.330-0.810	0.640	28.3- 57.9	4	0.040-0.780	0.165	23.5- 48.8
AMMONIA (MG/L)												
0.-1.5 M DEPTH	8	0.040-0.070	0.060	0.0- 1.2	8	0.030-0.060	0.040	0.0- 1.5	4	0.040-0.070	0.055	0.0- 0.0
MAX DEPTH**	4	0.030-0.050	0.040	30.5- 60.3	4	0.030-0.260	0.085	28.3- 57.9	4	0.040-1.740	0.310	23.5- 48.8
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	8	0.300-0.600	0.400	0.0- 1.2	8	0.300-0.800	0.400	0.0- 1.5	4	0.200-0.600	0.300	0.0- 0.0
MAX DEPTH**	4	0.200-0.400	0.250	30.5- 60.3	4	0.200-0.600	0.450	28.3- 57.9	4	0.200-2.400	0.450	23.5- 48.8
SECCHI DISC (METERS)	0	*****-*****	*****		0	*****-*****	*****		0	*****-*****	*****	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

BOONE RESERVOIR
STORET CODE 4704

PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	(4/ 3/73) S*** = 4 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(7/12/73) S*** = 4 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(10/27/73) S*** = 4 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	4	36.0- 40.0	36.5	0.0- 0.0	13	27.3- 73.0	28.6	0.0- 1.5	5	18.1- 96.0	60.0	0.0- 1.5
MAX DEPTH**	4	10.2- 10.8	10.6	17.7- 33.5	4	13.6- 23.7	17.3	4.3- 30.5	4	15.3- 17.7	15.5	7.0- 29.3
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	0	***** *****	*****	***** *****	9	8.4- 12.1	12.0	0.0- 1.5	1	8.8- 8.8	8.8	1.5- 1.5
MAX DEPTH**	4	6.3- 9.8	7.9	17.7- 33.5	4	0.4- 8.7	2.3	4.3- 30.5	3	0.6- 8.0	3.6	7.0- 29.3
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	3	195.- 280.	200.	0.0- 0.0	13	174.- 252.	182.	0.0- 1.5	5	184.- 218.	196.	0.0- 1.5
MAX DEPTH**	4	198.- 230.	220.	17.7- 33.5	4	125.- 185.	158.	4.3- 30.5	4	176.- 228.	190.	7.0- 29.3
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	3	8.0- 8.4	8.0	0.0- 0.0	5	7.8- 9.3	9.1	0.0- 1.5	5	7.5- 8.8	8.0	0.0- 1.5
MAX DEPTH**	4	7.8- 8.1	7.9	17.7- 33.5	2	7.0- 7.8	7.4	18.3- 30.5	4	7.2- 8.2	7.3	7.0- 29.3
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	3	56.- 121.	63.	0.0- 0.0	5	73.- 104.	79.	0.0- 1.5	4	69.- 99.	91.	0.0- 1.5
MAX DEPTH**	4	60.- 92.	79.	17.7- 33.5	2	78.- 88.	83.	18.3- 30.5	3	69.- 108.	87.	7.0- 29.3
TOTAL P (MG/L)												
0.-1.5 M DEPTH	3	0.055-0.112	0.061	0.0- 0.0	5	0.022-0.174	0.025	0.0- 1.5	5	0.022-0.168	0.039	0.0- 1.5
MAX DEPTH**	4	0.048-0.102	0.067	17.7- 33.5	2	0.055-0.057	0.056	18.3- 30.5	4	0.039-0.143	0.079	7.0- 29.3
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	3	0.033-0.260	0.068	0.0- 0.0	5	0.005-0.060	0.008	0.0- 1.5	4	0.013-0.076	0.039	0.0- 1.5
MAX DEPTH**	4	0.022-0.039	0.030	17.7- 33.5	2	0.007-0.008	0.007	18.3- 30.5	3	0.025-0.102	0.033	7.0- 29.3
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	3	0.970-1.000	0.990	0.0- 0.0	5	0.090-0.290	0.150	0.0- 1.5	4	0.150-0.840	0.250	0.0- 1.5
MAX DEPTH**	4	0.800-1.200	1.200	17.7- 33.5	2	0.450-0.680	0.565	18.3- 30.5	3	0.270-0.990	0.640	7.0- 29.3
AMMONIA (MG/L)												
0.-1.5 M DEPTH	3	0.070-0.400	0.380	0.0- 0.0	5	0.070-0.120	0.100	0.0- 1.5	4	0.050-0.090	0.055	0.0- 1.5
MAX DEPTH**	4	0.090-0.430	0.300	17.7- 33.5	2	0.090-1.000	0.545	18.3- 30.5	3	0.110-0.420	0.210	7.0- 29.3
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	3	0.500-0.700	0.600	0.0- 0.0	5	0.600-0.900	0.800	0.0- 1.5	5	0.400-0.800	0.500	0.0- 1.5
MAX DEPTH**	4	0.300-0.600	0.400	17.7- 33.5	2	0.300-1.200	0.750	18.3- 30.5	4	0.300-0.800	0.450	7.0- 29.3
SECCHI DISC (METERS)	0	***** *****	*****		0	***** *****	*****		0	***** *****	*****	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

B. Biological Characteristics:

1. Phytoplankton -

South Holston Reservoir

Sampling Date	Dominant Genera	Algal Units per ml
05/23/73	1. Flagellates	6,167
	2. Stephanodiscus	2,011
	3. Fragilaria	1,479
	4. Melosira	410
	5. Dactylococcopsis	36
	Other genera	72
	Total	10,175
08/20/73	1. Raphidiopsis	8,474
	2. Synedra	1,362
	3. Flagellates	794
	4. Tetraedron	303
	5. Achnanthes	303
	Other genera	795
	Total	12,031
10/27/73	1. Flagellates	772
	2. Melosira	386
	3. Raphidiopsis	318
	4. Tetraedron	318
	5. Cryptomonas	295
	Other genera	522
	Total	2,611

Boone Reservoir

Sampling Date	Dominant Genera	Algal Units per ml
04/03/73	1. Flagellates	4,268
	2. Stephanodiscus	2,044
	3. Melosira	661
	4. Dactylococcopsis	451
	5. Scenedesmus	60
	Other genera	60
	Total	7,544
10/27/73	1. Dactylococcopsis	11,379
	2. Flagellates	6,197
	3. Scenedesmus	3,048
	4. Tetraedron	2,083
	5. Cryptomonas	1,423
	Other genera	2,795
	Total	26,925

2. Chlorophyll a -

South Holston Reservoir

Sampling Date	Station Number	Chlorophyll a (ug/l)
05/23/73	1	11.6
	2	15.2
	3	12.9
	4	7.6
08/20/73	1	6.6
	2	6.9
	3	6.4
	4	11.1
10/27/73	1	3.2
	2	3.2
	3	3.6
	4	3.7

Boone Reservoir

Sampling Date	Station Number	Chlorophyll a (ug/l)
04/03/73	1	6.7
	2	35.2
	3	6.9
	4	5.8
07/12/73	1	7.1
	2	18.7
	3	12.7
	4	5.9
10/27/73	1	6.1
	2	7.1
	3	7.3
	4	16.2

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum Yield (mg/l-dry wt.)
South Holston Reservoir			
Control	0.008	0.676	0.1
0.05 P	0.058	0.676	13.7
0.05 P + 1.0 N	0.058	1.676	14.5
1.00 N	0.008	1.676	0.1
Boone Reservoir			
Control	0.020	1.335	8.1
0.05 P	0.070	1.335	23.1
0.05 P + 1.0 N	0.070	2.335	26.9
1.00 N	0.020	2.335	6.3

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, in the South Holston Reservoir sample indicates that the potential for primary productivity was low at the time of sampling. The lake was phosphorus-limited at that time as indicated by the increased growth of the test alga in response to an addition of orthophosphorus. Spikes with nitrogen and phosphorus simultaneously resulted in maximum yield while the addition of nitrogen alone did not stimulate growth beyond the control yield.

The mean total inorganic nitrogen to orthophosphorus ratios of 71/1, 93/1, and 34/1 observed in the lake on the first, second, and third sampling dates, respectively, substantiate the existence of phosphorus limitation. A minimum N/P ratio of 14/1 is considered necessary for phosphorus limitation to occur.

The control yield of the assay alga in the Boone Reservoir sample indicates that the potential for primary productivity was high at the time of sampling. Increased growth of the test alga in response to an addition of orthophosphorus indicates that the lake was phosphorus-limited when sampled. Spikes with

nitrogen and phosphorus simultaneously resulted in maximum yield. The addition of nitrogen alone did not stimulate growth beyond the control yield.

The mean total inorganic nitrogen to ortho-phosphorus ratios of 28/1 and 38/1 observed for the lake on the first and second sampling dates further substantiate phosphorus limitation at these times. However, in the July sampling round, the N/P ratio at site 04 was only 12/1, suggesting nitrogen limitation at that point. In October the mean N/P ratio for the lake was 17/1, although sites 03 and 04 had ratios characteristic of nitrogen-limited situations (in the case of site 03, however, the photic zone had a higher N/P ratio).

IV. NUTRIENT LOADINGS
(See Appendix D for data)

For the determination of nutrient loadings, the Tennessee National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the maps (pages v and vi), except for the high runoff month of February when two samples were collected. Sampling was begun in April 1973, and was completed in March 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Tennessee District Office of the USGS for the tributary sites nearest each lake.

In this report, nutrient loads for sampled tributaries except Possum Creek, L(1) (Boone Reservoir), were determined by using a modification of a USGS computer program for calculating stream loadings. Nutrient loads indicated for tributaries are those measured minus known point source loads, if any. Nutrient loads for Station L(1) were calculated using the mean annual flow and nutrient concentrations in Possum Creek at that site.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of USGS) were estimated by using the mean of the nutrient loads, in $kg/km^2/yr$ at Stations F(1) and G(1) for South Holston, and C(1), H(1), and K(1) for Boone Reservoir, and multiplying the means by the appropriate ZZ drainage area in km^2.

The operators of the Chilhowie and Elizabethton wastewater treatment plants provided monthly effluent samples and corresponding flow data. Nutrient loads for the Jacob's Creek Job Corps, Abingdon, Marion, Bluff City, Brush Creek, Knob Creek (2 plants), and Bristol wastewater treatment plants were estimated at 1.134 kg P and 3.401 kg N/capita/yr. Nutrient loads for the Damascus plant were estimated at 1.587 kg P and 4.263 kg N/capita/yr. Nutrient loadings for the Patrick Henry High School, Holston High School, and Emory and Henry College were estimated at 0.567 kg P and 1.701 kg N/capita/yr (covers 180 days).

A. Waste Sources:

1. Known municipal -

Name	Pop. Served	Treatment	Mean Flow ($m^3/d \times 10^3$)	Receiving Water
South Holston Reservoir:				
Holston High School	112	1.	0.042*	South Fork Holston River
Jacob's Creek Job Corps	250	4.	0.095*	South Holston Reservoir
Patrick Henry High School	150	1.	0.057*	Wolf Creek
Chilhowie	1,900	2.	1.560	Middle Fork Holston River
Abingdon	4,900	2.	1.855*	Wolf Creek
Emory and Henry College	1,000	?	0.378*	Hall Creek
Marion (Virginia)	8,900	3.	3.369*	Middle Fork Holston River
Damascus (Virginia)	1,500	none	0.568*	Beaverdam Creek
Boone Reservoir:				
Elizabethton†	14,064	4.	8.194	Watauga River
Bluff City	1,102	1.	0.246**	South Fork Holston River
Knob Creek (Johnson City)	15,600	4.	3.887**	Knob Creek/ Watauga River
Brush Creek (Johnson City)	28,080	4.	24.727**	Brush Creek/ Watauga River
Bristol #1††				Beaver Creek
Bristol #2	35,450	4.	26.722**	Beaver Creek

2. Known industrial - See discussion, pages 3-5.

Key: 1. Sand filter
2. Imhoff tank
3. Stabilization pond
4. Activated sludge

*Estimated at 0.3785 m^3/capita/day.
**Tennessee Department of Public Health (manuscript).
†Approximately 15% of the flow contributed by industry: textile mill, manufacturing of soup, toothpaste, air filter equipment, and clothing.
††Plant in standby status; used only during peak flow periods of high rainfall.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	South Holston Reservoir kg P/yr	% of total	Source	Boone Reservoir kg P/yr	% of total
a. Tributaries (nonpoint load) -			a. Tributaries (nonpoint load) -		
A(2) South Fork Holston River	8,525	15.8	A(2) South Holston River	9,620	5.0
B(1) Spring Creek	660	1.2	B(1) Boones Creek	505	0.3
C(1) Wolf Creek	2,845	5.3	C(1) Carroll Creek	110	0.1
D(1) Fifteenmile Creek	1,590	2.9	D(1) Watauga River	53,310	27.9
E(1) Middle Fork Holston River	16,025	29.7	E(1) Beaver Creek	28,760	15.1
F(1) Baumgartner Branch	70	0.1	F(1) Muddy Creek	945	0.5
G(1) Grable Branch	40	0.1	G(1) Wagner Creek (Bowman Creek)	425	0.2
			H(1) Gammon Creek	15	<0.1
			J(1) Indian Creek	680	0.4
			K(1) Dry Creek	260	0.1
			L(1) Possum Creek	290	0.1
b. Minor tributaries and immediate drainage (nonpoint load) -	1,660	3.1	b. Minor tributaries and immediate drainage (nonpoint load) -	475	0.2
c. Known municipal STP's -			c. Known municipal STP's -		
Jacob's Creek Job Corps	285	0.5	Elizabethton	4,145	2.2
Patrick Henry High School	85	0.2	Bluff City	1,250	0.6
Town of Chilhowie	3,000	5.6	Knob Creek (Johnson City)	17,690	9.3
Abingdon	5,555	10.3	Brush Creek (Johnson City)	31,845	16.7
Holston High School	65	0.1	Bristol #1	unknown	
Emory and Henry College	565	1.0	Bristol #2	40,200	21.0
Marion	10,095	18.7			
Damascus	2,380	4.4			
d. Septic tanks* -	10	<0.1	d. Septic tanks* -	120	0.1
e. Known industrial - None			e. Known industrial - See discussion, pages 3-5.		
f. Direct precipitation** -	535	1.0	f. Direct precipitation** -	310	0.2
Totals	53,990	100.0	Totals	190,960	100.0
2. Output - A(1) South Fork Holston River	8,300		Output - A(1) South Fork Holston River	99,020	
3. Net annual P accumulation -	45,690		Net annual P accumulation -	91,940	

*Estimate based on 25 lakeside residences and 1 camp for South Holston Reservoir, 431 lakeside residences for Boone Reservoir.
**Estimated (see NES Working Paper No. 175).

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

South Holston Reservoir			Boone Reservoir		
Source	kg N/yr	% of total	Source	kg N/yr	% of total
a. Tributaries (nonpoint load) -			a. Tributaries (nonpoint load) -		
A(2) South Fork Holston River	513,445	36.9	A(2) South Fork Holston River	1,258,480	30.4
B(1) Spring Creek	35,620	2.6	B(1) Boones Creek	24,790	0.6
C(1) Wolf Creek	63,640	4.6	C(1) Carroll Creek	5,780	0.1
D(1) Fifteenmile Creek	45,985	3.3	D(1) Watauga River	2,215,570	53.6
E(1) Middle Fork Holston River	546,520	39.2	E(1) Beaver Creek	194,720	4.7
F(1) Baumgartner Branch	4,280	0.3	F(1) Muddy Creek	26,085	0.6
G(1) Grable Branch	1,635	0.1	G(1) Wagner Creek (Bowman Creek)	9,725	0.2
			H(1) Gammon Creek	1,960	0.1
			J(1) Indian Creek	35,500	1.0
			K(1) Dry Creek	5,050	0.1
			L(1) Possum Creek	8,365	0.2
b. Minor tributaries and immediate drainage (nonpoint load) -	86,215	6.1	b. Minor tributaries and immediate drainage (nonpoint load) -	25,400	0.6
c. Known municipal STP's -			c. Known municipal STP's -		
Jacob's Creek Job Corps	850	0.1	Elizabethton	26,215	0.6
Patrick Henry High School	255	<0.1	Bluff City	3,750	0.1
Town of Chilhowie	5,140	0.4	Knob Creek (Johnson City)	53,055	1.3
Abingdon	16,665	1.2	Brush Creek (Johnson City)	95,500	2.3
Holston High School	190	<0.1	Bristol #1	unknown	
Emory and Henry College	1,700	0.1	Bristol #2	120,565	2.9
Marion	30,270	2.2			
Damascus	6,395	0.5			
d. Septic tanks* -	335	<0.1	d. Septic tanks* -	4,595	0.1
e. Known industrial - None			e. Known industrial - See discussion, pages 3-5.		
f. Direct precipitation** -	33,120	2.4	f. Direct precipitation** -	19,215	0.5
Totals	1,392,260	100.0	Totals	4,134,320	100.0
2. Output - A(1) South Fork Holston River	894,550		Output - A(1) South Fork Holston River	2,999,590	
3. Net annual N accumulation -	497,710		Net annual N accumulation -	1,134,730	

*Estimate based on 25 lakeside residences and 1 camp for South Holston Reservoir, 431 lakeside residences for Boone Reservoir.
**Estimated (see NES Working Paper No. 175).

D. Mean Annual Nonpoint Nutrient Export by Subdrainage Area:

South Holston Reservoir

Tributary	kg P/km^2/yr	kg N/km^2/yr
A(2) South Fork Holston River	10	621
B(1) Spring Creek	15	800
C(1) Wolf Creek	41	920
D(1) Fifteenmile Creek	38	1,090
E(1) Middle Fork Holston River	25	865
F(1) Baumgartner Branch	9	528
G(1) Grable Branch	12	511

Boone Reservoir

Tributary	kg P/km^2/yr	kg N/km^2/yr
A(2) South Fork Holston River	5	635
B(1) Boones Creek	14	698
C(1) Carroll Creek	14	761
D(1) Watauga River	24	985
E(1) Beaver Creek	102	690
F(1) Muddy Creek	23	646
G(1) Wagner Creek (Bowman Creek)	36	817
H(1) Gammon Creek	6	754
J(1) Indian Creek	14	744
K(1) Dry Creek	13	248
L(1) Possum Creek	13	385

E. Yearly Loadings:

In the following table, the existing phosphorus annual loading is compared to the relationship proposed by Vollenweider (1975). Essentially, his "eutrophic" loading is that at which the receiving water would become eutrophic or remain eutrophic; his "oligotrophic" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A "mesotrophic" loading would be considered one between "eutrophic" and "oligotrophic".

Note that Vollenweider's model may not apply to lakes with short hydraulic retention times or in which light penetration is severely restricted by high concentrations of suspended solids in the surface waters.

Total Yearly Phosphorus Loading ($g/m^2/yr$)

	South Holston Reservoir	Boone Reservoir
Estimated loading for	1.76	10.73
Vollenweider's "eutrophic" loading	1.02	2.06
Vollenweider's "oligotrophic" loading	0.51	1.03

V. LITERATURE REVIEWED

Clark, Larry R. 1976. Personal communication (review of preliminary reports; nitrogen loading for Beaunit Corporation). Tennessee Valley Authority, Chattanooga, Tennessee.

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Tennessee Department of Public Health, manuscript. Water Quality Management Plan for the Holston River Basin, October 1972. Division of Water Quality Control, Nashville, Tennessee.

U.S. Environmental Protection Agency. 1975. National Eutrophication Survey Methods 1973-1976. Working Paper No. 175. National Environmental Research Center, Las Vegas, Nevada, and Pacific Northwest Environmental Research Laboratory, Corvallis, Oregon.

Vollenweider, R. A. 1975. Input-Output Models With Special Reference to the Phosphorus Loading Concept in Limnology. Schweiz. Z. Hydrol. 37:53-84.

VI. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre/feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4725 SOUTH HOLSTON RESERVOIR

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 1820.8

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
4725A1	1820.8	21.97	23.56	15.32	18.35	23.70	29.17	29.73	34.83	34.72	27.69	22.14	22.57	25.32
4725A2	826.2	19.79	25.37	26.67	20.95	15.63	9.32	8.98	8.16	4.90	5.78	7.45	13.28	13.80
4725H1	44.5	0.60	0.86	1.16	0.97	0.76	0.48	0.39	0.32	0.25	0.30	0.32	0.51	0.57
4725C1	69.2	1.32	1.75	2.26	1.65	1.24	0.76	0.71	0.61	0.39	0.48	0.56	0.96	1.04
4725D1	42.2	0.81	1.07	1.25	1.01	0.76	0.46	0.43	0.37	0.24	0.29	0.34	0.59	0.63
4725E1	632.0	15.12	19.43	20.44	16.03	11.95	7.11	6.85	6.23	3.74	4.42	5.69	10.17	10.55
4725F1	8.1	0.109	0.157	0.211	0.176	0.138	0.086	0.071	0.057	0.045	0.054	0.057	0.093	0.104
4725G1	3.2	0.043	0.062	0.083	0.069	0.054	0.034	0.028	0.023	0.018	0.021	0.023	0.037	0.041
4725Z1	165.8	0.37	0.50	0.58	4.64	3.48	2.14	2.01	1.73	1.12	1.35	1.57	2.71	1.86

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 1820.8
SUM OF SUB-DRAINAGE AREAS = 1791.2

TOTAL FLOW IN = 344.40
TOTAL FLOW OUT = 303.75

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4725A1	4	73	31.998	15	3.171				
	5	73	56.917	16	46.156				
	6	73	35.679	16	9.628				
	7	73	31.432	28	33.697				
	8	73	39.927	16	41.909				
	9	73	34.547	18	27.014				
	10	73	22.257	17	6.003				
	11	73	21.861	17	41.059				
	12	73	47.006	15	48.705				
	1	74	81.553	12	86.933				
	2	74	68.810	2	57.200	16	65.978		
	3	74	36.246	2	47.289	16	40.776		
4725A2	4	73	23.956	15	15.857				
	5	73	25.202	16	13.904				
	6	73	14.272	16	21.039				
	7	73	9.373	28	7.079				
	8	73	8.127	16	7.617				
	9	73	4.644	18	4.446				
	10	73	7.787	17	5.692				
	11	73	14.357	17	7.334				
	12	73	26.816	15	24.806				
	1	74	42.475	12	74.756				
	2	74	35.962	2	28.600	16	47.572		
	3	74	27.637	2	17.245	16	34.830		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4725 SOUTH HOLSTON RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4725B1	4	73	1.056	15	0.932				
	5	73	1.203	16	0.861				
	6	73	0.779	16	0.651				
	7	73	0.648	28	0.510				
	8	73	1.014	16	1.017				
	9	73	0.430	18	0.422				
	10	73	0.394	17	0.334				
	11	73	0.527	17	0.351				
	12	73	1.045	15	0.597				
	1	74	2.217	12	4.927				
	2	74	1.900	2	2.373	16	3.313		
	3	74	1.320	2	1.192	16	1.246		
4725C1	4	73	1.829	15	1.385				
	5	73	2.019	16	1.271				
	6	73	1.172	16	1.014				
	7	73	0.680	28	0.496				
	8	73	1.150	16	1.136				
	9	73	0.535	18	0.518				
	10	73	0.651	17	0.507				
	11	73	1.065	17	0.600				
	12	73	1.962	15	1.543				
	1	74	3.540	12	6.881				
	2	74	3.002	2	3.058	16	4.757		
	3	74	2.200	2	1.640	16	2.540		
4725D1	4	73	1.116	15	0.844				
	5	73	1.232	16	0.776				
	6	73	0.716	16	0.617				
	7	73	0.413	28	0.303				
	8	73	0.702	16	0.694				
	9	73	0.328	18	0.317				
	10	73	0.399	17	0.309				
	11	73	0.651	17	0.365				
	12	73	1.201	15	0.940				
	1	74	2.155	12	4.191				
	2	74	1.832	2	1.875	16	2.888		
	3	74	1.342	2	1.002	16	1.552		
4725E1	4	73	18.321	15	12.091				
	5	73	19.284	16	10.647				
	6	73	10.930	16	8.070				
	7	73	7.391	28	5.409				
	8	73	6.238	16	5.833				
	9	73	3.569	18	3.398				
	10	73	5.975	17	4.361				
	11	73	10.987	17	5.607				
	12	73	20.530	15	19.001				
	1	74	32.564	12	57.200				
	2	74	27.439	2	21.974	16	36.529		
	3	74	21.153	2	13.196	16	26.590		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4725 SOUTH HOLSTON RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4725F1	4	73	0.193	15	0.170				
	5	73	0.220	16	0.157				
	6	73	0.142	16	0.263				
	7	73	0.118	28	0.093				
	8	73	0.185	16	0.186				
	9	73	0.079	18	0.077				
	10	73	0.072	17	0.061				
	11	73	0.096	17	0.064				
	12	73	0.190	15	0.109				
	1	74	0.405	12	0.900				
	2	74	0.345	2	0.433	16	0.606		
	3	74	0.241	2	0.218	16	0.228		
4725G1	4	73	0.076	15	0.067				
	5	73	0.086	16	0.062				
	6	73	0.056	16	0.103				
	7	73	0.037	28	0.030				
	8	73	0.072	16	0.073				
	9	73	0.031	18	0.030				
	10	73	0.028	17	0.024				
	11	73	0.038	17	0.025				
	12	73	0.074	15	0.043				
	1	74	0.159	12	0.354				
	2	74	0.136	2	0.170	16	0.238		
	3	74	0.094	2	0.085	16	0.089		
4725ZZ	4	73	5.154						
	5	73	5.692						
	6	73	3.313						
	7	73	1.917						
	8	73	3.256						
	9	73	1.322						
	10	73	1.693						
	11	73	2.704						
	12	73	5.578						
	1	74	9.968						
	2	74	8.467						
	3	74	6.201						

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4704 BOONE RESERVOIR

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 4765.6

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
4704A1	4765.6	72.49	69.66	61.73	60.03	58.33	58.90	58.90	69.94	68.53	65.13	69.09	77.59	65.85
4704A2	1981.3	25.77	27.89	19.91	21.97	26.53	31.26	31.43	36.53	35.82	28.80	23.39	25.00	27.86
4704B1	35.5	0.50	0.73	0.72	0.58	0.42	0.31	0.31	0.28	0.19	0.17	0.24	0.32	0.40
4704C1	7.6	0.106	0.157	0.156	0.125	0.089	0.067	0.067	0.060	0.042	0.036	0.052	0.068	0.085
4704D1	2064.2	36.81	38.23	34.55	38.79	29.17	29.17	28.32	34.26	31.15	27.98	28.32	33.70	32.50
4704E1	279.7	3.91	5.78	5.72	4.59	3.28	2.47	2.45	2.20	1.53	1.33	1.91	2.49	3.12
4704F1	40.4	0.57	0.84	0.83	0.66	0.47	0.36	0.35	0.32	0.22	0.19	0.28	0.36	0.45
4704G1	11.9	0.166	0.245	0.242	0.195	0.139	0.105	0.104	0.093	0.065	0.056	0.081	0.106	0.132
4704H1	2.6	0.037	0.055	0.054	0.043	0.031	0.023	0.023	0.021	0.014	0.012	0.018	0.024	0.029
4704J1	47.7	1.12	1.28	1.36	1.08	0.84	0.60	0.53	0.51	0.33	0.32	0.37	0.72	0.75
4704K1	20.4	0.48	0.55	0.58	0.46	0.36	0.26	0.23	0.22	0.14	0.14	0.16	0.31	0.32
4704L1	97.9	2.31	2.63	2.79	2.21	1.72	1.23	1.09	1.04	0.67	0.67	0.76	1.48	1.55
4704ZZ	155.4	2.47	3.65	3.60	2.89	2.06	1.56	1.54	1.39	0.97	0.84	1.20	1.57	1.97

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 4765.6
SUM OF SUB-DRAINAGE AREAS = 4744.7
TOTAL FLOW IN = 830.90
TOTAL FLOW OUT = 790.32

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4704A1	4	73	95.711	14	65.695				
	5	73	135.638	14	137.337				
	6	73	96.844	20	54.652				
	7	73	79.287	27	86.933				
	8	73	93.729	14	94.578				
	9	73	58.615	9	60.032				
	10	73	56.634	7	22.795				
	11	73	59.182	10	92.313				
	12	73	131.390	8	112.701				
	1	74	203.315	20	152.911				
	2	74	166.220	12	121.196	27	119.214		
	3	74	109.303	16	126.859	28	86.650		
4704A2	4	73	35.396	14	36.812				
	5	73	62.297	14	72.208				
	6	73	36.812	20	8.212				
	7	73	33.131	27	39.927				
	8	73	41.909	14	46.440				
	9	73	37.095	9	46.156				
	10	73	23.645	7	1.119				
	11	73	23.560	10	51.537				
	12	73	49.554	8	71.642				
	1	74	89.198	20	88.632				
	2	74	74.756	12	72.774	27	55.784		
	3	74	41.059	16	46.156	28	35.679		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4704 BOONE RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4704B1	4	73	0.799	14	0.402				
	5	73	1.036	14	1.104				
	6	73	0.527	20	0.379				
	7	73	0.343	27	0.609				
	8	73	0.399	14	0.171				
	9	73	0.249	9	0.083				
	10	73	0.175	7	0.194				
	11	73	0.343	10	0.240				
	12	73	0.609	8	0.745				
	1	74	1.962	20	0.821				
	2	74	1.509	12	0.784	27	1.079		
	3	74	1.104	16	1.178	28	0.278		
4704C1	4	73	0.172	14	0.087				
	5	73	0.222	14	0.237				
	6	73	0.113	20	0.081				
	7	73	0.074	27	0.131				
	8	73	0.086	14	0.037				
	9	73	0.054	9	0.018				
	10	73	0.037	7	0.042				
	11	73	0.073	10	0.052				
	12	73	0.131	8	0.160				
	1	74	0.422	20	0.176				
	2	74	0.323	12	0.168	27	0.231		
	3	74	0.237	16	0.253	28	0.059		
4704D1	4	73	56.917	14	50.970				
	5	73	64.846	14	72.208				
	6	73	52.386	20	44.457				
	7	73	36.812	27	41.059				
	8	73	40.776	14	30.016				
	9	73	12.743	9	5.890				
	10	73	21.521	7	7.136				
	11	73	22.540	10	25.768				
	12	73	62.863	8	90.048				
	1	74	82.968	20	59.465				
	2	74	71.642	12	63.430	27	64.846		
	3	74	57.766	16	38.228	28	19.624		
4704E1	4	73	6.286	14	3.171				
	5	73	8.155	14	8.722				
	6	73	4.163	20	2.973				
	7	73	2.707	27	3.200				
	8	73	3.143	14	1.345				
	9	73	1.965	9	0.654				
	10	73	1.376	7	1.529				
	11	73	2.693	10	1.894				
	12	73	4.814	8	5.862				
	1	74	15.461	20	6.485				
	2	74	11.893	12	6.173	27	8.495		
	3	74	8.722	16	9.288	28	2.183		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4704 BOONE RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4704F1	4	73	0.969	14	0.459				
	5	73	1.181	14	1.260				
	6	73	0.600	20	0.430				
	7	73	0.391	27	0.464				
	8	73	0.456	14	0.194				
	9	73	0.283	9	0.094				
	10	73	0.199	7	0.221				
	11	73	0.388	10	0.274				
	12	73	0.694	8	0.850				
	1	74	2.248	20	0.943				
	2	74	1.730	12	0.898	27	1.235		
	3	74	1.266	16	1.351	28	0.317		
4704G1	4	73	0.267	14	0.135				
	5	73	0.343	14	0.371				
	6	73	0.176	20	0.127				
	7	73	0.115	27	0.136				
	8	73	0.134	14	0.286				
	9	73	0.083	9	0.028				
	10	73	0.058	7	0.065				
	11	73	0.114	10	0.080				
	12	73	0.204	8	0.249				
	1	74	0.657	20	0.275				
	2	74	0.504	12	0.262	27	0.360		
	3	74	0.371	16	0.394	28	0.093		
4704H1	4	73	0.059	14	0.030				
	5	73	0.077	14	0.082				
	6	73	0.039	20	0.028				
	7	73	0.025	27	0.030				
	8	73	0.030	14	0.063				
	9	73	0.019	9	0.006				
	10	73	0.013	7	0.014				
	11	73	0.025	10	0.018				
	12	73	0.045	8	0.056				
	1	74	0.146	20	0.061				
	2	74	0.112	12	0.058	27	0.080		
	3	74	0.082	16	0.088	28	0.021		
4704J1	4	73	1.073						
	5	73	1.390	14	1.484				
	6	73	0.708	20	0.510				
	7	73	0.462	27	1.303				
	8	73	0.538	14	0.229				
	9	73	0.334	9	0.112				
	10	73	0.234	7	0.261				
	11	73	0.459	10	0.323				
	12	73	0.818	8	1.000				
	1	74	2.636	20	1.104				
	2	74	2.027	12	1.053	27	1.450		
	3	74	1.484	16	1.583	28	0.394		

TRIBUTARY FLOW INFORMATION FOR TENNESSEE 09/13/76

LAKE CODE 4704 BOONE RESERVOIR

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4704K1	4	73	0.462						
	5	73	0.597	14	0.637				
	6	73	0.303	20	0.0				
	7	73	0.198	27	0.234				
	8	73	0.230						
	9	73	0.144	9	0.0				
	10	73	0.101	7	0.0				
	11	73	0.197	10	0.0				
	12	73	0.351	8	0.0				
	1	74	0.875	20	0.0				
	2	74	0.869	12	0.450	27	0.620		
	3	74	0.637	16	0.680	28	0.159		
4704L1	4	73	2.205						
	5	73	2.860	14	3.058				
	6	73	1.455	20	1.045				
	7	73	0.949	27	1.124				
	8	73	1.102	14	0.470				
	9	73	0.688	9	0.229				
	10	73	0.481	7	0.535				
	11	73	0.943	10	0.663				
	12	73	1.679	8	2.056				
	1	74	5.409	20	2.268				
	2	74	4.163	12	2.163	27	2.973		
	3	74	3.058	16	3.256	28	0.765		
4704ZZ	4	73	3.964						
	5	73	5.154						
	6	73	2.622						
	7	73	1.708						
	8	73	1.985						
	9	73	1.240						
	10	73	0.866						
	11	73	1.699						
	12	73	3.030						
	1	74	9.769						
	2	74	7.504						
	3	74	5.493						

APPENDIX C

PHYSICAL AND CHEMICAL DATA

STORET RETRIEVAL DATE 76/09/10

472501
36 33 34.0 082 05 16.0 3
SOUTH HOLSTON LAKE
47163 TENNESSEE
040291

11EPALES 2111202
0204 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/23	10 00	0000	19.1		60	180	8.80	79	0.070	0.600	0.430	0.024
	10 00	0004	19.1	11.0		165	8.80	79	0.040	0.400	0.410	0.009
	10 00	0015	18.0	10.2		165	8.50	78	0.040	0.200	0.510	0.007
	10 00	0025	15.8	10.0		160	8.10	79	0.040	0.200	0.520	0.005
	10 00	0035	14.0	9.0		165	8.00	80	0.050	0.200	0.560	0.007
	10 00	0050	12.3	8.4		170	7.80	81	0.050	0.200	0.660	0.009
	10 00	0075	10.3	8.4		195	7.60	84	0.030	0.200	0.680	0.006
	10 00	0150	6.9	7.6		185	7.50	90	0.040	0.200	0.800	0.010
	10 00	0198	6.7	6.6		185	7.50	83	0.050	0.200	0.800	0.008
73/08/20	12 00	0000	26.8		144	161	8.80	68	0.060	0.800	0.080	0.011
	12 00	0005	26.8	9.0		154	8.80	66	0.040	0.400	0.060	0.007
	12 00	0020	26.8	9.0		152	8.30	65	0.050	0.400	0.100	0.008
	12 00	0040	21.4	3.4		163	7.90	80	0.060	0.300	0.550	0.004
	12 00	0060	16.8	1.2		142	7.80	78	0.040	0.300	0.740	0.006
	12 00	0080	14.9	3.0		130	7.60	74	0.030	0.200	0.770	0.006
	12 00	0100	12.9	4.2		119	7.50	74	0.030	0.200K	0.760	0.005
	12 00	0125	9.9	5.8		110	7.40	74	0.040	0.200	0.810	0.004
	12 00	0150	8.2	6.0		109	7.30	81	0.030	0.200	0.600	0.005
	12 00	0175	6.8	5.4		107	7.20	81	0.030	0.200	0.800	0.008
	12 00	0190	6.8	5.4		114	7.20	81	0.030	0.200K	0.810	0.006
73/10/27	09 20	0000	19.6		180	166	7.70	82	0.060	0.200	0.240	0.011
	09 20	0010	19.6	4.4		167	7.70	81	0.040	0.200K	0.230	0.011
	09 20	0030	19.6	5.0		164	7.60	81	0.040	0.200	0.230	0.010
	09 20	0060	18.9	0.2		162	7.30	83	0.050	0.200K	0.380	0.010
	09 20	0090	15.6	0.2		140	7.20	73	0.040	0.200K	0.540	0.008
	09 20	0110	12.1	0.6		128	7.10	71	0.030	0.200K	0.650	0.007
	09 20	0130	6.7	0.2		118	7.10	77	0.030	0.200K	0.780	0.008
	09 20	0160	5.8	4.0		119	7.20	80	0.040	0.200K	0.780	0.009

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

472501
36 33 34.0 082 05 16.0 3
SOUTH HOLSTON LAKE
47163 TENNESSEE
040291

11EPALES 2111202
0204 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/23	10 00	0000	0.029	11.6
	10 00	0004	0.027	
	10 00	0015	0.017	
	10 00	0025	0.018	
	10 00	0035	0.017	
	10 00	0050	0.013	
	10 00	0075	0.013	
	10 00	0150	0.011	
	10 00	0198	0.013	
73/08/20	12 00	0000	0.021	6.6
	12 00	0005	0.016	
	12 00	0020	0.013	
	12 00	0040	0.012	
	12 00	0060	0.012	
	12 00	0080	0.009	
	12 00	0100	0.011	
	12 00	0125	0.009	
	12 00	0150	0.010	
	12 00	0175	0.011	
	12 00	0190	0.011	
73/10/27	09 20	0000	0.009	3.2
	09 20	0010	0.009	
	09 20	0030	0.011	
	09 20	0060	0.009	
	09 20	0090	0.007	
	09 20	0110	0.006	
	09 20	0130	0.006	
	09 20	0160	0.008	

STORET RETRIEVAL DATE 76/09/10

472502
36 31 14.0 082 02 44.0 3
SOUTH HOLSTON LAKE
47163 TENNESSEE
040291

11EPALES 2111202
0200 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/23	12 45	0000	19.6		60	160	8.80	74	0.070	0.600	0.420	0.013
	12 45	0004	19.6	11.0		160	9.00	73	0.040	0.500	0.380	0.017
	12 45	0015	19.0	10.0		165	8.90	74	0.040	0.400	0.400	0.006
	12 45	0025	16.9	9.6		170	8.10	72	0.050	0.400	0.500	0.013
	12 45	0050	11.8	8.0		165	7.90	75	0.030	0.300	0.700	0.007
	12 45	0080	10.1	8.4		180	7.80	78	0.030	0.300	0.680	0.007
	12 45	0150	6.8	7.6		180	7.80	84	0.040	0.400	0.790	0.010
73/08/20	12 55	0000	27.1		114	162	8.60	70	0.040	0.400	0.080	0.004
	12 55	0005	27.0	8.8		160	8.30	68	0.030	0.300	0.060	0.003
	12 55	0020	26.2	6.6		191	7.80	83	0.040	0.300	0.260	0.004
	12 55	0030	23.3	1.8		205	6.70	98	0.040	0.300	0.640	0.006
	12 55	0050	18.5	0.2		148	6.60	82	0.030	0.200	0.700	0.004
	12 55	0075	15.2	2.6		134	6.50	77	0.030	0.200	0.760	0.009
	12 55	0100	12.2	4.6		115	6.40	80	0.030	0.200	0.850	0.008
	12 55	0125	10.0	4.2		115	6.40	80	0.030	0.300	0.850	0.012
	12 55	0160	7.2	2.0		121	6.30	87	0.060	0.300	0.780	0.009
73/10/27	09 50	0000	19.7		108	172	7.80	85	0.040	0.300	0.350	0.008
	09 50	0010	19.6	6.0		171	7.80	84	0.040	0.200	0.230	0.009
	09 50	0030	19.7	5.8		170	7.80	82	0.040	0.200K	0.230	0.009
	09 50	0060	19.0	3.4		172	7.50	84	0.040	0.200K	0.420	0.010
	09 50	0100	14.1	1.2		141	7.30	79	0.130	0.200K	0.450	0.013
	09 50	0120	8.9	1.0		133	7.10	88	0.460	0.500	0.160	0.014

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

472502
36 31 14.0 082 02 44.0 3
SOUTH HOLSTON LAKE
47163 TENNESSEE
040291

11EPALES 2111202
0200 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/23	12 45	0000	0.027	15.2
	12 45	0004	0.022	
	12 45	0015	0.020	
	12 45	0025	0.019	
	12 45	0050	0.015	
	12 45	0080	0.013	
	12 45	0150	0.059	
73/08/20	12 55	0000	0.010	6.9
	12 55	0005	0.010	
	12 55	0020	0.013	
	12 55	0030	0.011	
	12 55	0050	0.007	
	12 55	0075	0.007	
	12 55	0100	0.021	
	12 55	0125	0.012	
	12 55	0160	0.034	
73/10/27	09 50	0000	0.008	3.2
	09 50	0010	0.008	
	09 50	0030	0.009	
	09 50	0060	0.011	
	09 50	0100	0.013	
	09 50	0120	0.026	

STORET RETRIEVAL DATE 76/09/10

472503
36 36 13.0 082 02 34.0 3
SOUTH HOLSTON LAKE
47163 TENNESSEE
040291

11EPALES 2111202
0200 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/23	13	25 0000	19.0		54	170	8.90	77	0.060	0.300	0.400	0.006
	13	25 0004	19.0	11.4		170	9.00	78	0.060	0.300	0.410	0.008
	13	25 0015	18.1	10.8		175	8.90	79	0.060	0.200	0.430	0.018
	13	25 0025	17.0	8.8		180	8.40	77	0.080	0.200	0.500	0.008
	13	25 0050	11.7	7.6		180	7.90	75	0.040	0.200K	0.770	0.011
	13	25 0080	10.1	8.2		185	7.70	80	0.040	0.200K	0.770	0.005
	13	25 0140	7.3	5.6		200	7.60	86	0.030	0.200K	0.790	0.005
73/08/20	13	55 0000	27.1		75	162	7.90	73	0.040	0.500	0.070	0.006
	13	55 0005	27.0	7.0		161	8.00	73	0.040	0.400	0.040	0.007
	13	55 0015	27.0	8.6		160	7.90	73	0.040	0.400	0.050	0.005
	13	55 0025	24.4	3.2		206	7.10	99	0.040	0.300	0.570	0.005
	13	55 0045	19.6	0.2		169	7.00	92	0.050	0.300	0.590	0.004
	13	55 0065	16.4	1.2		136	6.80	80	0.040	0.300	0.720	0.004
	13	55 0100	12.1	2.2		119	6.40	79	0.060	0.300	0.760	0.009
	13	55 0120	10.4	0.2		132	6.90	91	0.260	0.600	0.500	0.007
73/10/27	10	30 0000	19.4		144	168	8.10	83	0.050	0.300	0.180	0.014
	10	30 0010	19.3	7.0		167	8.10	83	0.040	0.200	0.170	0.014
	10	30 0030	19.3	7.2		167	8.00	82	0.040	0.300	0.170	0.014
	10	30 0065	18.9	6.4		168	7.90	82	0.070	0.400	0.170	0.015
	10	30 0085	16.6	4.4		171	7.60	86	0.200	0.400	0.200	0.015
	10	30 0107	12.6	0.0		179	7.30	105	1.740	2.400	0.040	0.021

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

472503
36 36 13.0 082 02 34.0 3
SOUTH HOLSTON LAKE
47163 TENNESSEE
040291

11EPALES 2111202
0200 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/23	13 25	0000	0.024	12.9
	13 25	0004	0.022	
	13 25	0015	0.020	
	13 25	0025	0.017	
	13 25	0050	0.012	
	13 25	0080	0.011	
	13 25	0140	0.014	
73/08/20	13 55	0000	0.012	6.4
	13 55	0005	0.014	
	13 55	0015	0.013	
	13 55	0025	0.013	
	13 55	0045	0.012	
	13 55	0065	0.013	
	13 55	0100	0.021	
	13 55	0120	0.028	
73/10/27	10 30	0000	0.012	3.6
	10 30	0010	0.015	
	10 30	0030	0.014	
	10 30	0065	0.023	
	10 30	0085	0.035	
	10 30	0107	0.100	

STORET RETRIEVAL DATE 76/09/10

472504
36 35 08.0 082 00 50.0 3
SOUTH HOLSTON LAKE
47163 TENNESSEE

040291

11EPALES 2111202
0110 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/23	14 30	0000	16.2		60	180	8.70	84	0.060	0.400	0.440	0.006
	14 30	0004	18.1	9.6		180	8.70	84	0.060	0.300	0.430	0.004
	14 30	0015	17.7	8.6		180	8.20	84	0.090	0.300	0.450	0.011
	14 30	0030	15.4	7.0		170	7.80	69	0.030	0.200	0.710	0.007
	14 30	0050	11.7	7.0		170	7.60	69	0.030	0.200	0.750	0.004
	14 30	0080	10.1	6.8		190	7.40	80	0.040	0.200	0.860	0.009
	14 30	0100	9.5	4.8		195	7.30	85	0.040	0.300	0.860	0.017
73/08/20	14 25	0000	26.9		60	162	8.10	75	0.050	0.500	0.060	0.004
	14 25	0005	26.8	8.8		161	8.20	75	0.040	0.400	0.050	0.005
	14 25	0015	26.7	8.4		159	7.20	96	0.050	0.400	0.500	0.003
	14 25	0030	23.4	3.6		204	7.00	94	0.060	0.300	0.720	0.005
	14 25	0045	19.7	0.2		183	6.90	79	0.040	0.300	0.730	0.006
	14 25	0065	16.2	1.8		142	6.70	78	0.110	0.300	0.730	0.006
	14 25	0093	13.1	1.2		141	8.00	83	0.110	0.600	0.330	0.007
73/10/27	11 00	0000	19.1		84	167	8.20	82	0.070	0.600	0.140	0.014
	11 00	0010	19.1			166	8.20	80	0.060	0.300	0.150	0.014
	11 00	0025	19.1	7.0		167	8.20	80	0.060	0.300	0.150	0.021
	11 00	0055	19.0	6.8		169	8.10	78	0.060	0.200K	0.140	0.016
	11 00	0077	17.6	5.4		175	7.90	85	0.160	0.400	0.170	0.019

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/23	14 30	0000	0.02Y	7.6
	14 30	0004	0.027	
	14 30	0015	0.019	
	14 30	0030	0.014	
	14 30	0050	0.011	
	14 30	0080	0.017	
	14 30	0100	0.020	
73/08/20	14 25	0000	0.020	11.1
	14 25	0005	0.018	
	14 25	0015	0.017	
	14 25	0030	0.016	
	14 25	0045	0.017	
	14 25	0065	0.022	
	14 25	0093	0.035	
73/10/27	11 00	0000	0.019	3.7
	11 00	0010	0.018	
	11 00	0025	0.021	
	11 00	0055	0.016	
	11 00	0077	0.062	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

478401
36 26 20.0 082 26 14.0 3
BOONE RESERVOIR
47163 TENNESSEE
048291

11EPALES 2111202
0110 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/04/03	11 00	0000	13.4		36	195	8.00	63	0.400	0.600	0.990	0.033
	11 00	0005	13.2	9.2		193	8.00	62	0.370	0.480	0.950	0.031
	11 00	0015	13.1	9.0		193	8.00	62	0.370	0.500	0.960	0.032
	11 00	0025	12.9	9.0		200	8.00	61	0.380	0.480	0.970	0.032
	11 00	0040	12.3	8.2		205	8.00	71	0.320	0.480	0.990	0.042
	11 00	0060	11.9	8.2		220	8.00	82	0.250	0.380	1.000	0.048
	11 00	0080	11.0	8.2		220	8.00	95	0.150	0.200K	1.000	0.042
	11 00	0096	10.7	8.4		220	8.10	82	0.230	0.380	1.200	0.039
73/07/12	10 25	0000	28.2		73	182	9.10	73	0.080	0.980	0.150	0.007
	10 25	0008	27.3	9.0		183	9.10	74	0.070	0.480	0.320	0.005
	10 25	0015	22.5			181						
	10 25	0020	20.8	6.4		163	7.20	75	0.080	0.280	0.880	0.005
	10 25	0030	18.9			143						
	10 25	0040	17.4	2.6		126	7.10	55	0.070	0.280	1.280	0.006
	10 25	0050	16.8			121						
	10 25	0060	16.2			126						
	10 25	0070	15.7	3.6		135	7.40	73	0.060	0.280	1.180	0.017
	10 25	0080	15.1			134						
	10 25	0090	14.5	5.9		147	7.40	87	0.080	0.280K	0.740	0.015
	10 25	0100	14.2			144						
	10 25	0105	14.1	5.0		145	7.40	98	0.140	0.280K	0.740	0.015
	10 26	0000	28.1	12.1	73	181						
	10 26	0001	28.2	12.1		182						
	10 26	0002	28.2	12.0		182						
	10 26	0003	28.2	12.0		182						
	10 26	0004	28.2	12.0		182						
	10 26	0005	28.2	12.0		182						
	10 26	0006	28.1	11.9		182						
	10 26	0007	28.1	11.9		182						
	10 26	0008	27.1	11.6		183						
	10 26	0009	27.0	10.3		186						
	10 26	0010	26.6	9.3		186						
	10 26	0011	25.4	6.8		186						
	10 26	0012	24.8	5.5		188						
	10 26	0013	24.1	4.2		186						
	10 26	0014	23.7	2.4		185						

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470401
36 26 20.0 082 26 14.0 3
BOONE RESERVOIR
47163 TENNESSEE

040291

11EPALES 2111202
0110 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/10/27	11 40	0000	18.0		96	184	7.60			0.500		
	11 40	0010	18.0	5.4		184	7.50	67	0.090	0.300	0.740	0.014
	11 40	0030	18.0	4.4		185	7.50	68	0.090	0.300	0.750	0.015
	11 40	0045	17.5	2.8		176	7.30	69	0.060	0.200	0.940	0.020
	11 40	0065	16.4	3.2		160	7.30	75	0.040	0.200K	0.870	0.030
	11 40	0090	15.3			176	7.20	69	0.210	0.300	0.990	0.025

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/04/03	11 00	0000	0.055	6.7
	11 00	0006	0.053	
	11 00	0015	0.052	
	11 00	0025	0.050	
	11 00	0040	0.061	
	11 00	0060	0.062	
	11 00	0080	0.054	
	11 00	0096	0.061	
73/07/12	10 25	0000	0.022	7.1
	10 25	0008	0.021	
	10 25	0020	0.015	
	10 25	0040	0.016	
	10 25	0070	0.024	
	10 25	0090	0.031	
	10 25	0105	0.032	
73/10/27	11 40	0000	0.030	6.1
	11 40	0010	0.026	
	11 40	0030	0.023	
	11 40	0045	0.024	
	11 40	0065	0.030	
	11 40	0090	0.039	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470402
36 25 32.0 082 24 30.0 3
BOONE RESERVOIR
47163 TENNESSEE

040291

11EPALES 2111202
0102 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/04/03	11 35	0000	14.0		40							
	11 35	0006	13.7	9.2								
	11 35	0015	13.3	8.8		215	7.80	72	0.370	0.500	1.200	0.037
	11 35	0025	12.8	8.7		235	7.90	98	0.160	0.300	1.000	0.043
	11 35	0040	11.8	8.5		190	7.70	56	0.460	0.500	0.970	0.035
	11 35	0055	11.3	8.3		190	7.70	56	0.430	0.600	1.100	0.035
	11 35	0071	10.6	7.5		198	7.80	60	0.430	0.600	1.200	0.032
73/07/12	14 15	0000	28.9		72	174	9.20	75	0.100	0.600	0.140	0.005
	14 15	0005	28.6			175						
	14 15	0008	28.4	10.9		176	9.20	72	0.100	0.500	0.110	0.006
	14 15	0010	25.4			182						
	14 15	0015	22.6	4.5		181	7.30	60	0.300	0.600	0.540	0.005
	14 15	0020	20.5			162						
	14 15	0030	18.4	4.8		130	7.00	58	0.440	0.500	0.710	0.009
	14 15	0040	17.4			118						
	14 15	0050	16.6			109						
	14 15	0060	16.1	3.9		108	6.90	51	0.420	0.400	0.890	0.014
	14 15	0070	15.5			105						
	14 15	0080	15.1			111						
	14 15	0090	14.5			113						
	14 15	0100	13.7	0.4		125	7.00	78	1.000	1.200	0.450	0.007
73/10/27	12 00	0000	18.4		84	186	7.50	69	0.090	0.400	0.840	0.013
	12 00	0010	18.2	5.2		186	7.50	69	0.100	0.400	0.860	0.015
	12 00	0030	18.1	4.4		190	7.50	73	0.090	0.300	0.730	0.021
	12 00	0060	16.1	4.6		169	7.40	86	0.030	0.200K	0.690	0.035
	12 00	0080	15.7	2.6		184	7.40	93	0.120	0.300	0.630	0.045
	12 00	0096	15.3	0.6		185	7.20	87	0.420	0.800	0.640	0.033

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470402
36 25 32.0 082 24 30.0 3
BOONE RESERVOIR
47163 TENNESSEE
040291

11EPALES 2111202
0102 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/04/03	11 35	0000		35.2
	11 35	0015	0.055	
	11 35	0025	0.054	
	11 35	0040	0.061	
	11 35	0055	0.104	
	11 35	0071	0.102	
73/07/12	14 15	0000	0.025	18.7
	14 15	0008	0.029	
	14 15	0015	0.024	
	14 15	0030	0.028	
	14 15	0060	0.032	
	14 15	0100	0.055	
73/10/27	12 00	0000	0.022	7.1
	12 00	0010	0.032	
	12 00	0030	0.027	
	12 00	0060	0.037	
	12 00	0080	0.061	
	12 00	0096	0.092	

STORET RETRIEVAL DATE 76/09/10

470403
36 27 02.0 082 24 56.0 3
BOONE RESERVOIR
47163 TENNESSEE

040291

11EPALES 2111202
0115 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/04/03	12 10	0000	14.0		37	200	8.00	56	0.380	0.700	0.970	0.260
	12 10	0006	13.6	9.0		200	8.00	56	0.380	0.500	0.960	0.026
	12 10	0015	13.2	9.2		200	7.90	60	0.380	0.400	0.960	0.029
	12 10	0022	12.7	8.8		200	7.90	69	0.340	0.400	0.960	0.036
	12 10	0035	12.3	8.5		220	7.80	82	0.300	0.400	0.980	0.048
	12 10	0050	11.7	8.4		220	7.80	82	0.270	0.300	1.000	0.047
	12 10	0070	11.1	6.8		190	7.90	55	0.420	0.600	0.970	0.025
	12 10	0090	10.5	7.8		190	7.90	56	0.420	1.000	0.980	0.025
	12 10	0110	10.2	6.3		220	7.80	76	0.370	0.500	1.200	0.029
73/07/12	13 05	0000	28.2		60	193	9.00	79	0.070	0.600	0.180	0.008
	13 05	0007	27.8	10.5		192	8.90	83	0.060	0.300	0.180	0.005
	13 05	0010	26.2			187						
	13 05	0017	21.5	1.6		171	7.20	81	0.310	0.500	0.680	0.004
	13 05	0020	20.3			157						
	13 05	0030	18.4			135						
	13 05	0040	17.5	1.6		140	7.30	72	0.060	0.200K	0.990	0.005
	13 05	0050	16.9			147						
	13 05	0060	16.4			164						
	13 05	0070	15.9	4.1		163	7.40	103	0.060	0.200K	0.[illegible]0	0.015
	13 05	0080	15.3			157						
	13 05	0090	14.6			153						
	13 05	0100	14.4			153						
	13 05	0110	14.1	4.7		153	7.40	101	0.260	0.800	0.640	0.016
	13 06	0000	25.0	8.4	60	188						
	13 06	0011	24.2	4.8		187						
	13 06	0012	23.7	3.6		187						
	13 06	0013	23.2	2.6		186						
	13 06	0014	22.5	2.1		185						
	13 06	0015	22.2	1.8		181						
	13 06	0016	21.8	1.7		180						
	13 06	0017	21.7	1.7		175						
	13 06	0018	21.2	1.7		172						
	13 06	0019	21.1	1.7		170						
	13 06	0020	21.0	2.2		173						
73/10/27	12 35	0000	18.7		60	196	8.00	85	0.060	0.500	0.320	0.016
	12 35	0010	18.3	5.4		198	7.80	88	0.080	0.300	0.320	0.019

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470403
36 27 02.0 082 24 56.0 3
BOONE RESERVOIR
47163 TENNESSEE

040291

11EPALES 2111202
0115 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/10/27	12 35	0030	17.9	3.6		210	7.70	99	0.040	0.200K	0.570	0.062
	12 35	0055	16.4			197	7.70	96	0.160	0.300	0.480	0.074
	12 35	0080	15.7	3.6		195	7.50			0.500		

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/04/03	12 10	0000	0.061	6.9
	12 10	0006	0.047	
	12 10	0015	0.046	
	12 10	0022	0.054	
	12 10	0035	0.065	
	12 10	0050	0.068	
	12 10	0070	0.051	
	12 10	0090	0.055	
	12 10	0110	0.073	
73/07/12	13 05	0000	0.023	12.7
	13 05	0007	0.025	
	13 05	0017	0.018	
	13 05	0040	0.012	
	13 05	0070	0.022	
	13 05	0110	0.048	
	13 06	0000		12.7
73/10/27	12 35	0000	0.039	7.3
	12 35	0010	0.030	
	12 35	0030	0.072	
	12 35	0055	0.083	
	12 35	0080	0.067	

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/10

470404
36 28 40.0 082 19 47.0 3
BOONE RESERVOIR
47163 TENNESSEE

040291

11EPALES 2111202
0064 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/04/03	13	0000	14.8		36	280	8.40	121	0.070	0.500	1.000	0.068
	13	0006	14.6	11.2		295	8.40	115	0.050	0.400	1.200	0.068
	13	0015	14.1	10.6		260	8.00	108	0.050	0.300	0.910	0.040
	13	0025	14.0	10.2		260	8.30	105	0.080	0.300	0.960	0.047
	13	0040	13.1	10.0		270	8.10	110	0.080	0.200	0.940	0.043
	13	0058	10.8	9.8		230	8.00	92	0.090	0.300	0.800	0.022
73/07/12	15	0000	26.0	11.6	36	238	9.30	91	0.120	0.900	0.090	0.011
	15	0005	27.3	9.0		252	7.80	104	0.100	0.800	0.290	0.060
	15	0008	25.9	5.0		288	8.00	122	0.100	0.600	0.550	0.095
	15	0010	23.5			283						
	15	0015	22.0	1.8		247	7.40	118	0.110	0.500	0.900	0.144
	15	0020	20.3			222						
	15	0030	18.3	4.5		190	7.50	101	0.130	0.200	0.770	0.021
	15	0040	16.8			161						
	15	0050	14.6			145						
	15	0060	13.6	8.7		142	7.80	88	0.090	0.300	0.680	0.008
73/10/26	14	0000	18.8		48	218	8.80	99	0.050	0.800	0.180	0.076
	14	0005	18.1	8.8		213	8.60	96	0.050	0.500	0.150	0.062
	14	0015	18.1	8.0		219	8.40	103	0.080	0.500	0.180	0.077
	14	0023	17.7	8.0		228	8.20	108	0.110	0.400	0.270	0.102

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/04/03	13	0000	0.112	5.8
	13	0006	0.122	
	13	0015	0.079	
	13	0025	0.083	
	13	0040	0.076	
	13	0058	0.048	
73/07/12	15	0000	0.077	5.9
	15	0005	0.174	
	15	0008	0.182	
	15	0015	0.166	
	15	0030	0.038	
	15	0060	0.057	
73/10/26	14	0000	0.168	16.2
	14	0005	0.113	
	14	0015	0.132	
	14	0023	0.143	

APPENDIX D

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/09/09

4725A1
36 31 27.0 082 05 29.0 4
S FORK HOLSTON RIVER
47 7.5 HOLSTON VALL
O/S HOLSTON RES 040291
S HOLSTON DAM SPILLWAY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	09	15	0.650	0.140	0.005K	0.005K	0.025
73/05/16	09	00	0.700	0.100K	0.005K	0.005K	0.005K
73/06/16	09	00	0.730	0.750	0.017	0.007	0.007
73/07/28	15	00	0.730	0.240	0.059	0.005K	0.007
73/08/16	09	00	0.750	0.280	0.012	0.009	0.180
73/09/18	09	35	0.720	0.240	0.009	0.005K	0.005K
73/10/17	09	15	0.620	1.450	0.120		0.005
73/11/17	08	20	0.350	1.350	0.120	0.008	0.010
73/12/15	11	40	0.360	0.700	0.032	0.005K	0.010
74/01/12	13	05	0.470	0.400	0.016	0.012	0.015
74/02/02	10	20	0.528	0.300	0.010	0.005K	0.010
74/02/16	09	00	0.500	0.400	0.010	0.010	0.010
74/03/02	08	55	0.588	0.500	0.025	0.005	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4725A2
36 39 10.0 081 53 15.0 4
S FORK HOLSTON RIVER
47 7.5 ABINDON VA
I/S HOLSTON RES 040291
SEC RD BRDG AT ALVARADO
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	10	55	0.430	0.310	0.036	0.005K	0.025
73/05/16	10	45	0.290	2.200	0.066	0.005K	0.005K
73/06/16	10	50	0.740	0.920	0.026	0.020	
73/07/28	16	35	0.400	0.480	0.019	0.008	0.030
73/08/16	10	25	0.410	1.260	0.035	0.008	0.030
73/09/19	10	10	0.350	0.260	0.023	0.005K	0.015
73/10/17	10	35	0.273	0.850	0.050	0.008	0.020
73/11/17	09	50	0.220	1.350	0.088	0.008	0.010
73/12/15	13	40	0.480	0.500	0.018	0.006	0.015
74/01/12	14	40	0.616	0.300	0.016	0.012	0.035
74/02/02	12	05	0.650	0.300	0.010	0.010	0.042
74/02/16	10	20	0.528	0.400	0.010	0.010	0.040
74/03/02	10	25	0.620	0.300	0.015	0.005K	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4725d1
36 36 29.0 082 02 30.0 4
SPRING CREEK
47 7.5 HOLSTON VALL
T/S HOLSTON RES 040291
ST RT 665 BRDG .75 SSE OF CLEVELAND
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	09 40		1.420	0.170	0.006	0.005K	0.010
73/05/16	09 20		1.440	0.100K	0.009	0.005K	0.010
73/06/16	09 25		1.620	0.210	0.016	0.010	0.020
73/07/28	15 20		1.720	0.100K	0.011	0.009	0.025
73/08/16	09 15		1.740	0.350	0.152	0.009	0.020
73/09/18	09 55		1.380	0.790	0.026	0.010	0.025
73/10/17	09 35		1.300	0.500	0.024	0.010	0.020
73/11/17	08 40		1.010	1.600	0.068	0.018	0.110
73/12/15	12 00		1.440	0.100	0.012	0.008	0.010
74/01/12	12 25		1.520	0.500	0.016	0.020	0.045
74/02/02	10 55		1.340	0.800	0.015	0.020	
74/02/16	09 18		1.360	0.600	0.010	0.020	0.090
74/03/02	09 10		1.680	0.700	0.030	0.010	0.035

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4725C1
36 38 00.0 081 59 30.0 4
WOLF CREEK
47 7.5 ABINDON VA
T/S HOLSTON RES 040291
ST RT 75 BRDG JUST SE OF G REEN SPRINGS
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	09 55		1.620	0.390	0.055	0.100	0.190
73/05/16	09 35		1.560	0.340	0.060	0.126	0.200
73/06/16	09 40		1.640	0.600	0.063	0.150	0.250
73/07/28	15 30		1.640	0.280	0.020	0.110	0.200
73/08/16	09 30		1.740	1.150	0.200	0.180	0.265
73/09/18	10 05		1.600	1.100	0.096	0.330	0.480
73/10/17	09 45		1.680	0.750	0.075	0.290	0.410
73/11/17	08 55		1.400	1.550	0.150	0.230	0.280
73/12/15	12 10		1.600	0.700	0.060	0.144	0.220
74/01/12	13 35		1.930	0.750	0.020	0.040	0.125
74/02/02	11 00		1.440	1.200	0.030	0.070	0.330
74/02/16	09 25		1.520	1.200	0.035	0.055	0.170
74/03/02	09 20		1.760	0.700	0.035	0.065	0.155

STORET RETRIEVAL DATE 76/09/09

472501
36 38 37.0 081 57 37.0 4
FIFTEENMILE CREEK
47 7.5 ABINDON VA
T/S HOLSTON RES 040291
SEC RD BRDG JUST BELO DAM AT PARKS MILL
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	10 00		1.560	0.320	0.050	0.006	0.040
73/05/16	09 45		1.500	0.260	0.027	0.008	0.040
73/06/16	09 45		2.100	0.800	0.053	0.018	0.105
73/07/28	15 40		1.820	0.250	0.033	0.022	0.050
73/08/16	09 40		1.840	0.390	0.029	0.025	0.060
73/09/18	10 15		1.340	0.400	0.028	0.017	0.050
73/10/17	09 50		1.160	0.750	0.038	0.074	0.110
73/11/17	09 05		1.040	1.150	0.071	0.016	0.030
73/12/15	12 25		1.510	1.300	0.032	0.020	0.050
74/01/12	13 45		1.920	0.600	0.020	0.024	0.075
74/02/02	11 15		1.800	1.100	0.095	0.035	0.165
74/02/16	09 32		1.680	0.900	0.075	0.050	0.160
74/03/02	09 30		1.900	0.400	0.015	0.020	0.070

STORET RETRIEVAL DATE 76/09/09

4725E1
36 41 35.0 081 53 40.0 4
MIDDLE FORK HOLSTON RIVER
47 7.5 ABINDON VA
I/S HOLSTON RES 040291
SHALLOW FORD BRDG ON JEB STUART HWY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	10	45	1.020	0.170	0.005K	0.020	0.050
73/05/16	10	25	0.930	0.270	0.028	0.026	0.040
73/06/16	10	35	1.360	0.460	0.042	0.052	0.080
73/07/28	16	20	0.810	1.260	0.026	0.048	0.110
73/08/16	10	10	1.320	1.150	0.460	0.054	0.085
73/09/18	11	20	0.820	0.400	0.020	0.063	0.095
73/10/17	10	50	0.800	0.950	0.029	0.058	0.085
73/11/17	10	05	0.570	0.900	0.044	0.034	0.040
73/12/15	11	00	1.000	0.300	0.024		0.090
74/01/12	14	50	1.340	0.600	0.020	0.032	0.095
74/02/02	12	20	1.340	0.600	0.025	0.040	0.120
74/02/16	10	35	1.180	1.000	0.045	0.050	0.190
74/03/02	10	35	1.500	0.600	0.025	0.020	0.060

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4725F1
36 38 40.0 081 55 00.0 4
BAUMGARDNER BRANCH
47 7.5 ABINDON VA
T/S HOLSTON RES 040291
SEC RD BRDG .25 MI SE OF DENTON CEMETERY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	11 05		0.560	0.260	0.009	0.005K	0.025
73/05/16	10 55		0.590	0.200	0.008	0.006	0.015
73/06/16	09 00		0.810	0.310	0.018	0.013	0.025
73/07/28	16 45		0.720	0.150	0.010	0.010	0.020
73/08/16	10 35		0.650	1.400	0.054	0.010	0.015
73/09/18	11 00		0.660	0.290	0.017	0.012	0.025
73/10/17	10 25		0.800	0.200	0.016	0.012	0.012
73/11/17	09 40		0.530	1.150	0.058	0.009	0.010
73/12/15	13 26		0.320	0.800	0.016	0.005K	0.015
74/01/12	14 25		0.830	0.400	0.024	0.012	0.030
74/02/02	13 55		0.470	1.300	0.035	0.010	
74/02/16	10 10		0.380	1.900	0.040	0.025	
74/03/02	10 10		0.770	0.400	0.015	0.005K	0.035

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4725G1
36 36 42.0 081 57 33.0 4
GRABLE BRANCH
47 7.5 SHADY VALLEY
T/S HOLSTON RES 040291
BANK 300 FT BELO PINE VALLEY MINNOW FARM
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/15	10 20		0.700	0.200	0.006	0.005K	0.025
73/05/16	09 55		0.620	0.230	0.029	0.005K	0.015
73/06/16	10 00		0.800	0.560	0.021	0.017	0.045
73/07/28	15 40		0.670	0.290	0.009	0.008	0.030
73/08/16	09 50		0.670	1.260	0.050	0.009	0.020
73/09/18	10 25		0.580	0.380	0.010	0.013	0.040
73/10/17	10 05		0.620	0.700	0.038	0.020	0.020
73/11/17	09 15		0.590	1.400	0.084	0.010	0.010
73/12/15	12 45		0.660	0.500	0.020	0.028	0.045
74/01/12	14 00		0.840	0.200	0.008	0.020	0.035
74/02/02	11 31		0.540		0.035	0.010	
74/02/16	09 49		0.530	0.800	0.015	0.010	
74/03/02	09 50		0.900	0.400	0.015	0.015	0.035

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4725CA PD4725CA P001350
36 41 13.0 081 58 55.0 4
ABINGDON VA
47 7.5 ABINGDON
T/SOUTH HOLSTON RESERVOI 040291
WOLF CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
									0.500
73/10/11	09 30		1.000	9.200	0.080	1.470	2.900		
73/11/13	13 30		0.600	15.500	0.710	3.780	8.400		
73/12/13	11 00		0.930	15.000	0.230	2.240	4.500		
74/01/14	20 30		3.360	2.200		0.340	1.450		
74/02/14	13 30		2.240	3.500		0.780	2.800		
74/03/14	15 30		1.560	7.000		0.070	3.800		
74/04/12	13 30		1.240	6.800	0.140	1.450	4.100		
74/05/14	13 15		1.080	11.000	0.38J	2.100	4.300		
74/06/17	08 40		0.960	6.000	0.100	0.826	1.450		
74/07/19	08 00		1.200	3.000	1.700	0.740	1.200		
74/08/15	14 00		0.320	17.000	0.410	3.450	7.200		
74/09/13	11 30		0.320	18.800	2.200	2.500	4.800		
74/10/14	08 30		0.640	5.700	0.085	1.400	2.200		

STORET RETRIEVAL DATE 76/09/09

4725EA IP4725XA P003500
36 48 00.0 081 40 30.0 4
TOWN OF CHILHOWIE
47 7.5 CHILAMOWIE
T/SOUTH HOLSTEN RES
MIDDLE FORK HOLSTON RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/11/29	08 00								
CP(T)-			0.260	14.000	1.100	6.500	8.000	0.315	0.254
73/11/29	16 00								
73/12/28	08 00								
CP(T)-			0.540	11.500	0.870	4.400	5.550	0.324	0.356
73/12/28	16 00								
74/01/31	08 00								
CP(T)-			0.440	6.000	0.340	2.760	5.400	0.419	0.457
74/01/31	16 00								
74/02/28	08 00								
CP(T)-			0.840	5.800		1.950	3.750	0.458	0.485
74/02/28	16 00								
74/03/28	08 00								
CP(T)-			0.360	7.700		2.800	4.600	0.481	0.509
74/03/28	16 00								

STORET RETRIEVAL DATE 76/09/09

4725YA SF4725YA P000150
36 43 13.0 081 57 33.0 4
PATRICK HENRY HI SCH. ABINGDON
47 7.5 ABINGDON
T/SOUTH HOLSTEN RES 040291
UNNAMED STREAM/WOLF CREEK
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
74/05/14	15 30		14.300	2.800	0.140	3.900	4.800		
74/06/14	20 00		1.600	1.000K	0.050K	0.100	0.135		
74/07/15	13 00		0.120	2.400		0.210	0.220		
74/08/13	16 00		1.480	1.500	0.081	0.300	0.470		
74/09/16	08 00		1.840	0.680	0.050	0.315	0.465		
74/10/14	20 30		2.320	1.100	0.065	0.630	0.740		
74/11/17	19 00		5.040	3.600	0.050K	1.300	1.500		
74/12/16	20 00		2.480	1.500	0.050K	0.700	0.720		
75/01/13	20 00		3.120	1.150	0.080K	0.050K	0.900		
75/02/14	12 00		2.480	1.000K	0.080K	0.360	0.370		
75/03/17	20 00		2.240	1.000K	0.080K	0.125	0.191		
75/04/14	12 00		30.000	3.200	0.300	5.300	5.300		
75/05/15	22 00		9.400	2.000	0.050K	1.150	1.100		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4704A1
36 26 30.0 082 26 16.0 4
S FORK HOLSTON RIVER
47 7.5 BOONE DAM
0/BOONE RES 040291
BANK BELO BOONE DAM ON E BANK
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	08	50	0.940	0.490	0.240	0.028	0.045
73/05/14	11	20	0.680	0.290	0.113	0.018	0.035
73/06/20	13	35	0.680	1.570	0.150	0.024	0.025
73/07/27	08	10	0.690	0.320	0.084	0.033	0.080
73/08/14	13	20	0.780	0.200	0.048	0.025	0.030
73/09/09			0.880	0.260	0.040	0.016	0.030
73/10/07	14	10	0.820	1.930	0.220	0.018	0.032
73/11/10	14	25	0.630	1.400	0.154	0.046	0.075
73/12/08	12	30	0.810	0.600	0.144	0.028	0.055
74/01/20	10	45	0.756	0.100K	0.072	0.020	0.040
74/02/12	13	50	0.800	0.500	0.055	0.020	0.050
74/02/27	10	50	0.580	0.800	0.025	0.010	0.050
74/03/28	10	30	0.740	0.500	0.115	0.035	0.045

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4704A2
36 29 13.0 082 11 45.0 4
S FORK HOLSTON RIVER
47 7.5 BLUFF CITY
1/BOONE RES 040291
WEAVER RD BRDG 5 MI NE OF BLUFF CITY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	10 25		0.720	0.290	0.019	0.005K	0.015
73/05/14	12 45		0.620	0.380	0.013	0.005K	0.010
73/06/20	14 40		0.790	1.230	0.067	0.008	0.010
73/07/27	09 10		0.740	0.370	0.058	0.005K	0.005K
73/08/14	14 25		0.730	0.140	0.021	0.008	0.015
73/09/09	10 40		0.720	0.100K	0.022	0.005K	0.005K
73/10/07	11 10		0.610	2.600	0.730	0.006	0.006
73/11/10	10 21		0.450	0.275	0.026	0.006	0.015
73/12/08	11 15		0.360	0.800	0.264	0.005K	0.015
74/01/20	14 20		0.528	0.100	0.020	0.005K	0.005K
74/02/12	15 00		1.700	0.100K	0.015	0.010	0.010
74/02/27	12 50		0.690	0.300	0.085	0.020	0.020
74/03/28	12 45		0.730	0.600	0.030	0.005	0.005

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

470481
36 23 30.0 082 23 46.0 4
BOONES CREEK
47 7.5 BOONE DAM
T/BOONE RES 040291
BANK JUST ABOV MOUTH AT FLOURVILLE
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	08 40		1.400	1.260	0.031	0.005K	0.015
73/05/14	11 05		1.320	0.260	0.030	0.014	0.040
73/06/20	13 20		1.380		0.075	0.023	0.050
73/07/27	07 57		1.340	0.520	0.095	0.020	0.075
73/08/14	13 03		1.240	0.200	0.017	0.027	0.065
73/09/09			1.200	0.255	0.031	0.020	0.045
73/10/07	13 50		1.060	1.950	0.399	0.006	0.025
73/11/10	14 00		0.900	0.400	0.027	0.020	0.055
73/12/08	12 45		1.200	0.900	0.064	0.012	0.030
74/01/20	10 15		1.680	0.100K	0.012	0.012	0.035
74/02/12	11 20		0.520	0.300	0.005K	0.005K	0.015
74/02/27	10 26		1.500	0.300	0.035	0.010	0.025
74/03/28	10 00		1.520	0.300	0.015	0.010	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4704C1
36 23 13.0 082 23 35.0 4
CARROLL CREEK
47 7.5 BOONE DAM
T/BOONE RES 040291
BRDG JUST ABOV MOUTH 1 MI NE CROCH XRD
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	08 27		2.060	1.800	0.069	0.007	0.020
73/05/14	10 50		1.800	0.200	0.048	0.013	0.035
73/06/20	13 10		1.860	0.600	0.022	0.023	0.050
73/07/27	07 50		1.700	0.190	0.066	0.014	0.040
73/08/14	12 55		1.580	0.270	0.023	0.020	0.035
73/09/09			1.540	0.280	0.060	0.030	0.065
73/10/07	13 45		1.480	0.850	0.052	0.018	0.065
73/11/10	14 10		1.540	0.450	0.027	0.022	0.040
73/12/08	13 00		1.760	0.100	0.016	0.020	0.035
74/01/20	10 10		2.100	0.100K	0.016	0.012	0.040
74/02/12	11 15		2.200	0.400	0.010	0.015	0.025
74/02/27	10 18		2.000	0.500	0.030	0.010	0.030
74/03/28	09 55		2.000	0.200	0.020	0.005K	0.035

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

470401
36 23 02.0 082 19 15.0 4
WATAUGA RIVER
47 7.5 BLUFF CITY
I/BOONE RES 040291
GIBSON BRDG DOWNSTREAM OF SAYLOR ISLAND
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	11 05		0.680	1.050	0.730	0.037	0.055
73/05/14	14 05		0.570	3.200	0.760	0.029	0.065
73/06/20	15 35		0.830	3.360	0.740	0.069	0.085
73/07/27	10 05		0.710	0.480	0.252	0.037	0.060
73/08/14	15 25		1.060	0.967	0.620	0.078	0.090
73/09/09	09 45		1.260	3.200	1.800	0.160	0.220
73/10/07	10 05		0.990	1.000	0.580	0.154	0.210
73/11/10	09 45		0.740	1.700	1.000	0.037	0.060
73/12/08	10 30		0.552	1.500	0.264	0.056	0.070
74/01/20	13 15		0.660	0.192	0.192	0.016	0.035
74/02/12	10 56		0.720	0.500	0.155	0.025	0.040
74/02/27	10 00		0.588	0.500	0.135	0.010	0.040
74/03/28	09 40		0.850	1.700	1.250	0.030	0.065

STORET RETRIEVAL DATE 76/09/09

4704E1
36 29 56.0 082 18 03.0 4
BEAVER CREEK
47 7.5 BLUFF CITY
T/BOONE RES 040291
SEC RD BRDG .75 MI N OF BUFFALO
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	09 57		1.700	1.200	0.540	0.490	0.580
73/05/14	12 25		1.620	0.675	0.220	0.270	0.400
73/06/20	14 15		1.940	2.100	0.450	0.820	0.870
73/07/27	08 52		1.540	1.300	0.320	0.520	0.680
73/08/14	14 03		1.420	0.970	0.147	0.420	0.585
73/09/09	11 00		1.440	3.400	1.200	1.160	1.350
73/10/07	11 45		1.240	2.700	1.260	1.440	1.800
73/11/10	10 50		1.640	3.000	1.200	1.080	
73/12/08	11 30		1.760	2.000	0.630	0.680	0.890
74/01/20	14 40		1.900	0.100K	0.080	0.096	0.150
74/02/12	14 35		1.760	0.500	0.100	0.180	0.250
74/02/27	11 30		1.700	1.000	0.105	0.145	0.230
74/03/28	12 00		1.850	0.900	0.175	0.160	0.220

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4704F1
36 28 48.0 082 21 42.0 4
MUDDY CREEK
47 7.5 BLUFF CITY
T/BOONE RES 040291
PRIVATE RD BRDG SE OF MUDDY CREEK CHURCH
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	09	35	1.300	0.110	0.026	0.032	0.045
73/05/14	12	00	1.140	0.100K	0.023	0.027	0.050
73/06/20	14	03	1.180	2.100	0.078	0.044	0.070
73/07/27	08	38	0.780	1.100	0.075	0.065	0.140
73/08/14	13	50	1.040	0.250	0.016	0.058	0.080
73/09/09			1.100	0.220	0.054	0.120	0.145
73/10/07	11	55	0.860	1.350	0.006	0.014	0.050
73/11/10	11	10	0.850	0.550	0.024	0.108	
73/12/08	11	50	1.260	1.700	0.124	0.050	0.075
74/01/20	11	15	1.520	0.100	0.014	0.026	0.035
74/02/12	14	20	1.430	0.200	0.020	0.020	0.020
74/02/27	11	20	1.300	0.400	0.035	0.025	0.025
74/03/28	11	15	1.340	0.400	0.020	0.025	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

470461
36 29 00.0 082 23 45.0 4
WAGNER CREEK
47 7.5 BOONE DAM
T/BOONE RES 040291
BANK AT SE EDGE OF HOLSTON
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	09 25		1.700	0.290	0.044	0.036	0.065
73/05/14	11 55		1.500	0.150	0.010	0.015	0.060
73/06/20	13 55		1.500	2.400	0.067	0.036	0.090
73/07/27	08 32		1.400	0.580	0.086	0.170	0.260
73/08/14	13 42		1.500	1.600	0.052	0.066	0.155
73/09/09	11 30		1.500	0.160	0.048	0.039	0.065
73/10/07	12 10		1.260	1.650	0.110	0.064	0.145
73/11/10	11 15		1.420	0.800	0.061	0.071	
73/12/08	12 00		1.600	0.500	0.022	0.026	0.130
74/01/20	11 10		1.920	0.200	0.008	0.016	0.075
74/02/12	14 10		1.850	0.300	0.015	0.015	0.030
74/02/27	11 10		1.700	0.400	0.035	0.020	0.045
74/03/28	11 00		1.760	0.450	0.035	0.025	0.042

STORET RETRIEVAL DATE 76/09/09

4704M1
36 27 30.0 082 25 15.0 4
GAMMON CREEK
47 7.5 BOONE DAM
T/BOONE RES 040291
BANK NEXT TO SEC RD .75 MI S OF TRI-CITY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/04/14	09	07	1.800	0.100K	0.045	0.005K	0.010
73/05/14	11	30	1.620	0.100K	0.018	0.009	0.015
73/06/20	13	45	1.620	1.540	0.084	0.013	0.015
73/07/27	08	22	1.540	0.800	0.040	0.011	0.020
73/08/14	13	30	1.520	0.100K	0.020	0.011	0.015
73/09/09	11	46	1.520	0.120	0.039	0.011	0.020
73/10/07	14	20	1.460	4.300	2.100	0.006	0.025
73/11/10	14	45	1.400	0.100K	0.024	0.009	0.010
73/12/08	12	10	1.520	1.300	0.020	0.005K	0.012
74/01/20			2.000	0.100K	0.012	0.005K	0.015
74/02/12	14	03	1.900	0.500	0.005K	0.030	0.065
74/02/27	11	05	1.800	0.100	0.005		0.020
74/03/28	10	45	1.850	0.200	0.020	0.005	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4704J1
36 27 30.0 082 15 29.0 4
INDIAN CREEK
47 7.5 BLUFF CITY
T/BOONE RESERVOIR 040291
2NDRY RD BRDG .5 MI S OF BLUFF CITY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/05/14	13 40		0.680	0.270	0.029	0.010	0.025K
73/06/20	15 10		1.080	1.900	0.052	0.017	0.025
73/07/27	09 40		0.980	1.285	0.115	0.028	0.110
73/08/14	14 55		1.000	0.290	0.019	0.015	0.035
73/09/09	10 15		1.120	0.200	0.040	0.010	0.025
73/10/07	10 35		0.870	0.750	0.110	0.011	0.035
73/11/10	10 10		0.700	0.600	0.032	0.014	0.020
73/12/08	11 05		0.800	0.600	0.024	0.012	0.015
74/01/20	13 45		1.120	0.100K	0.008	0.008	0.010
74/02/12	15 27		0.940	0.200	0.005	0.012	0.012
74/02/27	13 20		0.924	0.100K	0.010	0.010	0.020
74/03/28	13 30		0.924	0.400	0.020	0.010	0.010

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4704K1
36 27 57.0 082 13 15.0 4
DRY CREEK
47 7.5 KEENBURG
T/BOONE RESERVOIR 040291
2NDRY RD BRDG 2 MI E OF BLUFF CITY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/05/14	13	15	0.023	0.100K	0.013	0.010	0.015
73/07/27	09	32	0.087	0.170	0.046	0.012	0.027
74/02/12	15	15	0.200	0.100	0.005	0.010	0.020
74/02/27	13	06	0.148	0.900	0.300	0.010	0.035
74/03/28	13	15	0.140	0.600	0.035	0.015	0.025

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4704L1
36 28 38.0 082 12 30.0 4
POSSUM CREEK
47 7.5 KEENBURG
T/BOONE RESERVOIR 040291
BANK 3 MI ENE OF BLUFF CITY
11EPALES 2111204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/05/14	13 00		0.147	0.290	0.023	0.008	0.015
73/06/20	14 55		0.370	3.900	0.115	0.066	0.105
73/07/27	09 22		0.400	0.150	0.060	0.019	0.020
73/08/14	14 35		0.378	0.100K	0.015	0.011	0.020
73/09/04	10 30		0.440	0.340	0.078	0.020	0.035
73/10/07	10 50		0.140	1.200	0.068	0.020	0.030
73/11/10	10 20		0.147	0.475	0.052	0.011	0.011
73/12/04	11 10		0.352	0.350	0.076	0.005K	0.005
74/01/20	14 10		0.460	0.100	0.012	0.008	0.010
74/02/12	15 10		0.570	0.300	0.010	0.010	0.025
74/02/27	13 00		0.460	0.400	0.055	0.010	0.030
74/03/28	13 00		0.470	0.500	0.030	0.005	0.015

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/09/09

4704DC AS4704DC P012000
36 21 12.0 082 14 58.0 4
ELIZABETHTON
47 7.5 ELIZABETHTON
T/BOONE RESERVOIR 040291
WATAUGA RIVER
11EPALES 2141204
0000 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/06/04	01	00	6.800	1.200	0.315	1.800	2.300	2.200	2.500
73/07/05	12	00							
CP(T)-			8.800	1.250	0.130	0.550	0.900	3.800	2.000
73/07/06	12	00							
73/08/05	01	00							
CP(T)-			11.400	0.580	0.350	1.540	1.950	1.100	1.710
73/08/06	01	00							
73/09/08	12	00							
CP(T)-			12.100	0.680	0.110	1.300	1.700	1.300	1.500
73/09/09	12	00							
73/10/03	12	00							
CP(T)-			13.400	1.000		0.950	1.350	1.500	2.100
73/10/04	12	00							
74/01/08	12	00							
CP(T)-			5.800	0.710	0.110	0.340	0.700	2.200	2.600
74/01/09	12	00							
74/02/05	00	00							
CP(T)-			5.040	1.000K	0.053	0.680	1.050	2.500	2.000
74/02/05	24	00							
74/03/04									
CP(T)-			4.100	7.000	0.160	0.270	1.000	2.200	2.200
74/03/05									
74/04/03	00	00							
CP(T)-			2.760	1.300	0.240	0.275	0.890	3.100	2.500
74/04/04	00	00							
74/05/05	12	00							
CP(T)-			3.680	4.800	0.086	2.100	3.000	1.900	2.200
74/05/06	12	00							
74/06/07			8.400	1.000K	0.050K	1.200	1.650	2.000	2.500

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX E

PARAMETRIC RANKINGS OF LAKES SAMPLED BY NES IN 1974

STATE OF TENNESSEE

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P
4701	LAKE BARKLEY	0.128	0.480	473.381	12.723	10.400	0.047
4704	BOONE RESERVOIR	0.052	0.995	442.071	11.415	14.690	0.029
4705	CHEATHAM RESERVOIR	0.142	0.460	473.800	6.160	9.600	0.084
4707	CHEROKEE LAKE	0.051	0.780	448.667	12.162	15.000	0.022
4708	CHICKAMAUGA LAKE	0.031	0.440	463.833	3.111	9.690	0.012
4711	DOUGLAS LAKE	0.026	0.440	442.823	4.553	15.000	0.014
4712	FORT LOUDON RESERVOIR	0.054	0.550	465.571	4.776	12.600	0.025
4713	GREAT FALLS LAKE	0.020	0.405	444.417	3.983	14.800	0.007
4717	NICKAJACK RESERVOIR	0.051	0.495	459.833	2.742	9.700	0.025
4720	OLD HICKORY LAKE	0.058	0.330	469.769	8.931	9.400	0.019
4722	WATTS BAR RESERVOIR	0.032	0.510	462.250	5.550	11.000	0.012
4723	J. PERCY PRIEST RESERVOI	0.056	0.155	430.200	9.993	15.000	0.021
4724	TIM'S FORD RESERVOIR	0.021	0.445	398.167	6.739	14.900	0.009
4725	SOUTH HOLSTON LAKE	0.014	0.570	404.750	7.667	15.000	0.006
4727	REELFOOT LAKE	0.233	0.170	477.917	80.958	13.200	0.059
4728	WOODS RESERVOIR	0.017	0.320	429.083	7.392	15.000	0.005

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
4701	LAKE BARKLEY	13 (2)	40 (6)	13 (2)	7 (1)	73 (11)	13 (2)	159
4704	BOONE RESERVOIR	40 (6)	0 (0)	73 (11)	20 (3)	47 (7)	20 (3)	200
4706	CHEATHAM RESERVOIR	7 (1)	47 (7)	7 (1)	40 (6)	90 (13)	0 (0)	191
4707	CHEROKEE LAKE	50 (7)	7 (1)	53 (8)	13 (2)	13 (0)	40 (6)	176
4708	CHICKAMAUGA LAKE	67 (10)	63 (9)	33 (5)	93 (14)	90 (13)	70 (10)	416
4711	DOUGLAS LAKE	73 (11)	63 (9)	67 (10)	80 (12)	13 (0)	60 (9)	356
4712	FORT LOUDON RESERVOIR	33 (5)	20 (3)	27 (4)	73 (11)	60 (9)	27 (4)	240
4713	GREAT FALLS LAKE	87 (13)	73 (11)	60 (9)	87 (13)	40 (6)	93 (14)	440
4717	NICKAJACK RESERVOIR	50 (7)	33 (5)	47 (7)	100 (15)	80 (12)	33 (5)	343
4720	OLD HICKORY LAKE	20 (3)	80 (12)	20 (3)	33 (5)	100 (15)	53 (8)	386
4722	WATTS BAR RESERVOIR	60 (9)	27 (4)	40 (6)	67 (10)	67 (10)	70 (10)	331
4723	J. PERCY PRIEST RESERVOI	27 (4)	100 (15)	80 (12)	27 (4)	13 (0)	47 (7)	294
4724	TIM'S FORD RESERVOIR	80 (12)	53 (8)	100 (15)	60 (9)	33 (5)	80 (12)	406
4725	SOUTH HOLSTON LAKE	100 (15)	13 (2)	93 (14)	47 (7)	13 (0)	87 (13)	353
4727	REELFOOT LAKE	0 (0)	93 (14)	0 (0)	0 (0)	53 (8)	7 (1)	153
4728	WOODS RESERVOIR	93 (14)	87 (13)	87 (13)	53 (8)	13 (0)	100 (15)	433